

DVP-NC685V

RMT-D159A

SERVICE MANUAL

US Model

Self Diagnosis
Supported model



SPECIFICATIONS

System

Laser: Semiconductor laser

Signal format system: NTSC

Audio characteristics

Frequency response: DVD VIDEO (PCM 96 kHz): 2 Hz to 44 kHz (44 kHz: -2 dB ±1 dB)/Super Audio CD: 2 Hz to 100 kHz (50 kHz: -3 dB ±1 dB)/CD: 2 Hz to 20 kHz (±0.5 dB)

Signal-to-noise ratio (S/N ratio): 115 dB
(LINE OUT L/R (AUDIO) 1/2 jacks only)

Harmonic distortion: 0.003 %

Dynamic range: DVD VIDEO/Super Audio CD: 103 dB/CD: 99 dB

Wow and flutter: Less than detected value
(±0.001% W PEAK)

Outputs

(Jack name: Jack type/Output level/Load impedance)

LINE OUT (AUDIO) 1/2: Phono jack/2 Vrms/10 kilohms

DIGITAL OUT (OPTICAL): Optical output jack/-18 dBm (wave length: 660 nm)

DIGITAL OUT (COAXIAL): Phono jack/0.5 Vp-p/75 ohms

5.1CH OUTPUT: Phono jack/2 Vrms/10 kilohms

COMPONENT VIDEO OUT(Y, Pb, Pr): Phono jack/Y: 1.0 Vp-p/Pb, Pr:
interlace*=0.648 Vp-p, progressive or
interlace**=0.7 Vp-p/75 ohms

* BLACK LEVEL is ON

** BLACK LEVEL is OFF

LINE OUT (VIDEO) 1/2: Phono jack/1.0 Vp-p/75 ohms

S VIDEO OUT 1/2: 4-pin mini DIN/Y:
1.0 Vp-p, C: 0.286 Vp-p/75 ohms

General

Power requirements:

120 V AC, 60 Hz

Power consumption:

19 W

Dimensions (approx.):

430 × 95.5 × 409 mm (17 × 3 6/8 × 16 1/8 in.) (width/height/depth) incl. projecting parts

Mass (approx.): 5.0 kg (11 1/32 lb)

Operating temperature: 5 °C to 35 °C
(41 °F to 95 °F)

Operating humidity: 25 % to 80 %

Supplied accessories

Check that you have the following items:

- Audio/video cord (pinplug × 3 ↔ pinplug × 3) (1)
- Remote commander (remote) (1)
- Size AA (R6) batteries (2)

Specifications and design are subject to change without notice.



CD/DVD PLAYER

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

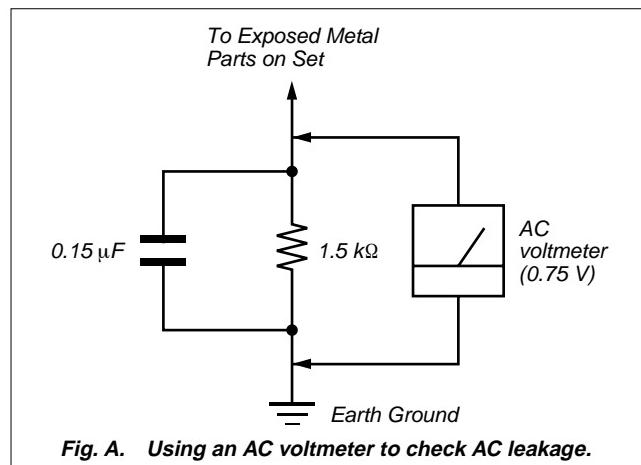


Fig. A. Using an AC voltmeter to check AC leakage.

WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK △ OR DOTTED LINE WITH MARK △ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

Unleaded solder

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.

(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
Soldering irons using a temperature regulator should be set to about 350°C.
Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

CAUTION:

The use of optical instrument with this product will increase eye hazard.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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SERVICE NOTE

1. NOTE ON REMOVING THE UPPER CASE

- 1) Remove the four tapping screws and three screws. (See Fig. 1)
- 2) Open the sides of case. (See Fig. 1)
- 3) Remove the upper case in the direction of the arrow **A**.

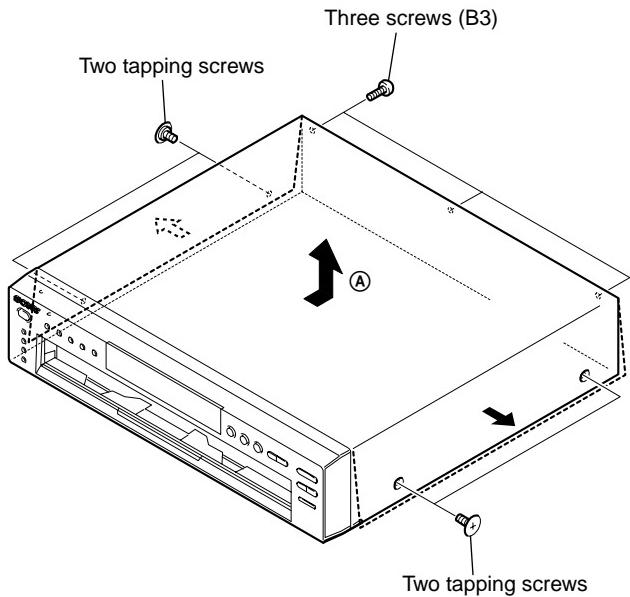


Fig. 1

2. DISC REMOVAL PROCEDURE

- 1) Insert a flat-head (-) screwdriver into a hole at the bottom, and rotate the cam gear in the direction of the arrow **A**. (See Fig.2)

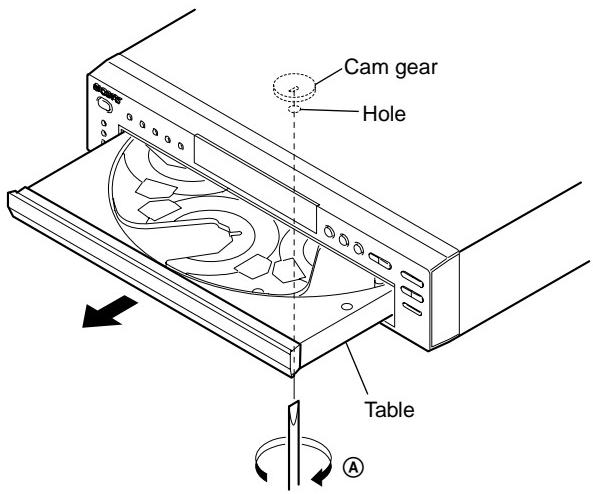


Fig. 2

3. NOTE ON REMOVING THE TABLE ASS'Y

- 1) Remove the two screws. (See Fig. 3)

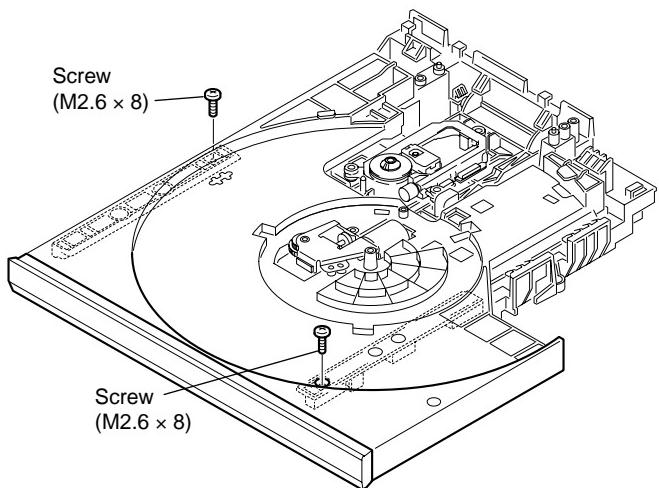


Fig. 3

- 2) Remove the two Plates (guide) in the direction of the arrows **A** and **B**.
- 3) Remove the Table ass'y in the direction of the arrow **C**.
- 4) Remove the Flexible flat cable (See Fig. 4).

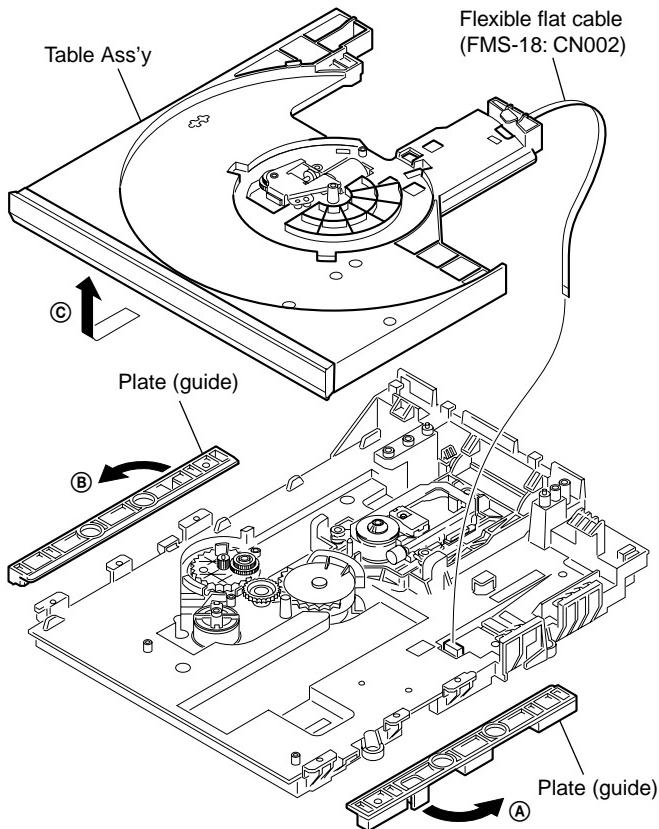


Fig. 4

4. NOTE ON MOUNTING THE GEARS

- 1) Mount the gear (chuck). (See Fig. 5)
- 2) Rotate the gear (chuck) in the direction of the arrow. (down position) (See Fig. 5)

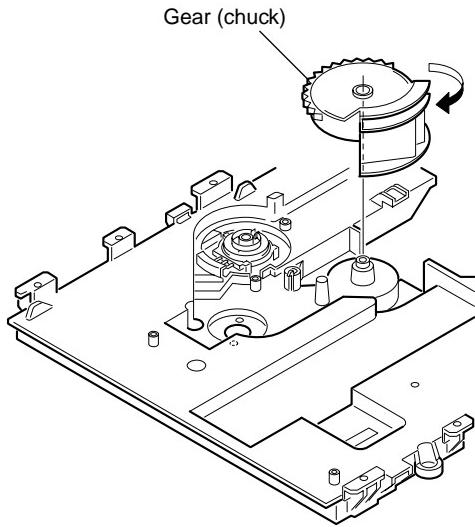


Fig. 5

- 5) Mount the gear (idler) while aligning the engagement of the gear (swing) and the gear (chuck). (See Fig. 7)

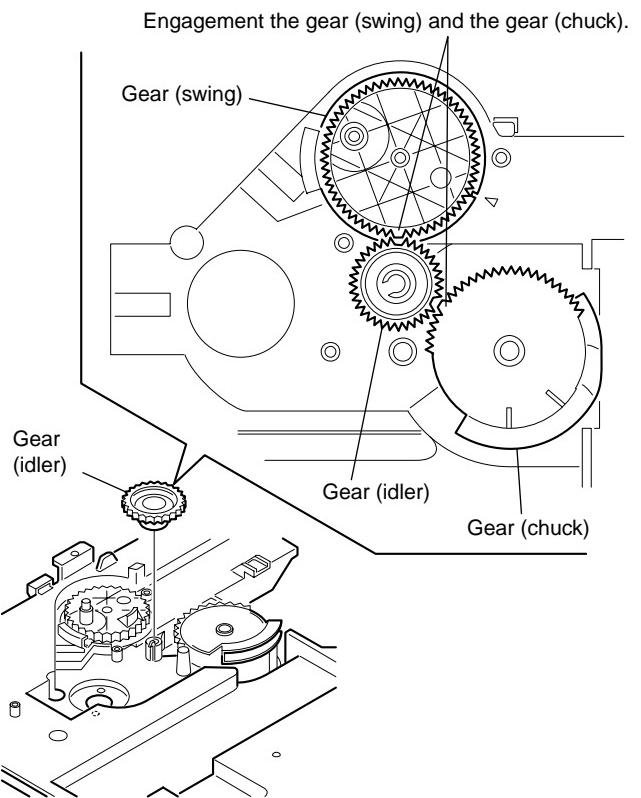


Fig. 7

- 3) Connect the boss of the gear (swing) with the groove of the rotary encoder and mount the gear (swing). (See Fig. 6)
- 4) Align triangle mark of the chassis with the groove of the gear (swing).

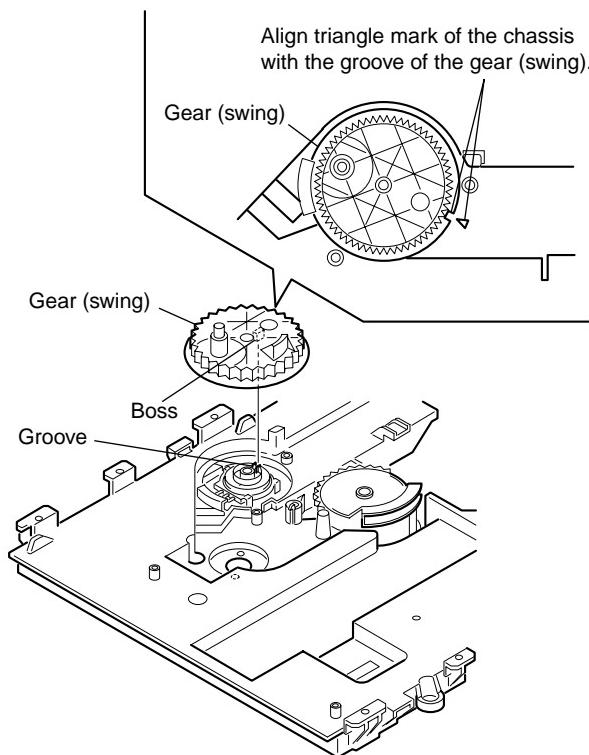


Fig. 6

5. HOW TO SERVICE THE MB-110 BOARD

Jig

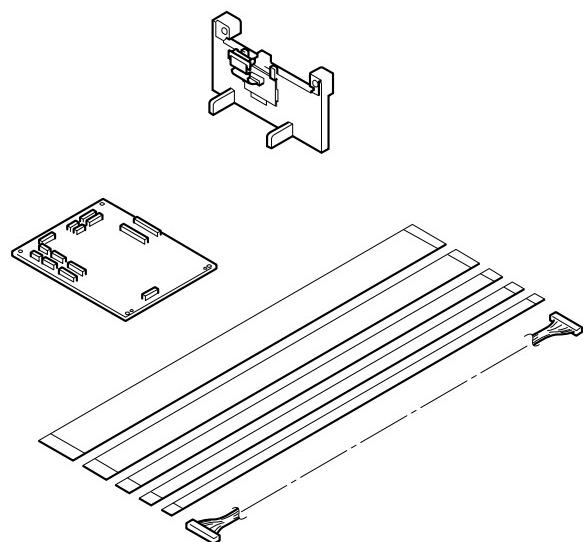


Fig. 8

- 1) Remove the upper case from the set. (Refer to section 2-2)
- 2) Remove the MB-110 board. (Refer to section 2-7)
- 3) Set the MB-110 board in the stand as shown in Fig. 9.

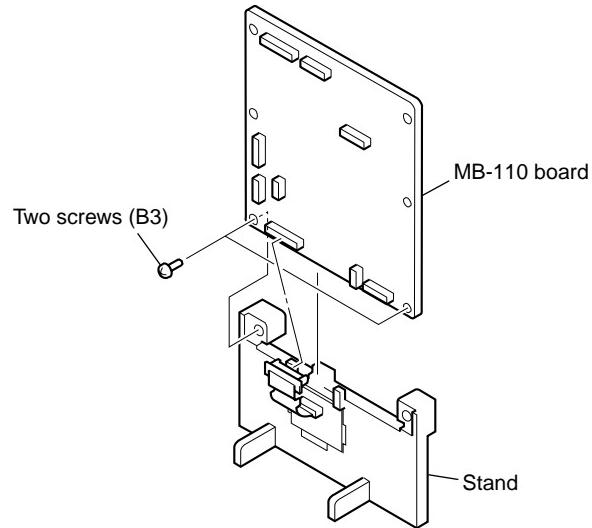


Fig. 9

- 4) Set the board in the place where the MB-110 board is removed, as shown in Fig. 10.

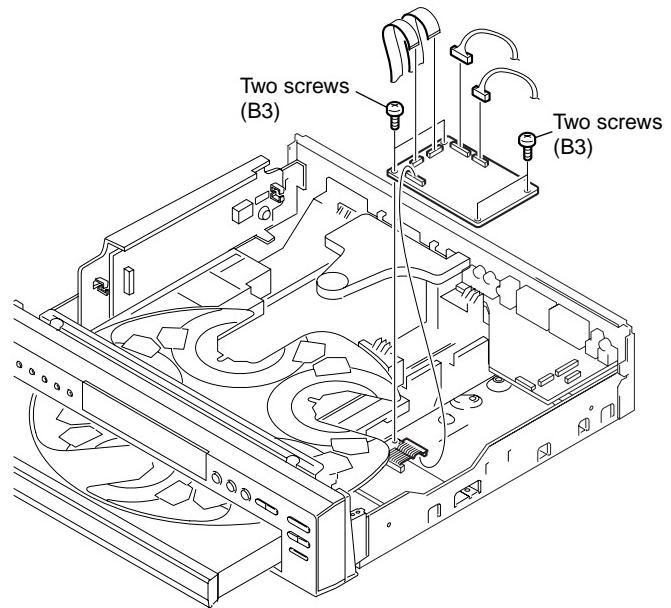


Fig. 10

- 5) Set the four flexible flat cables as shown in Fig. 11.

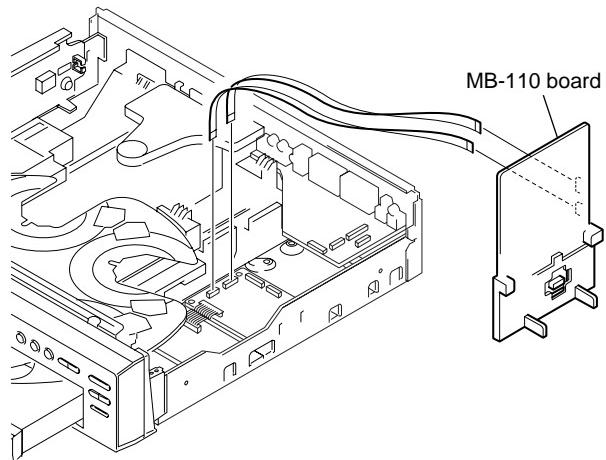


Fig. 11

- 6) Set the flexible flat cable and the harness as shown in Fig. 12.

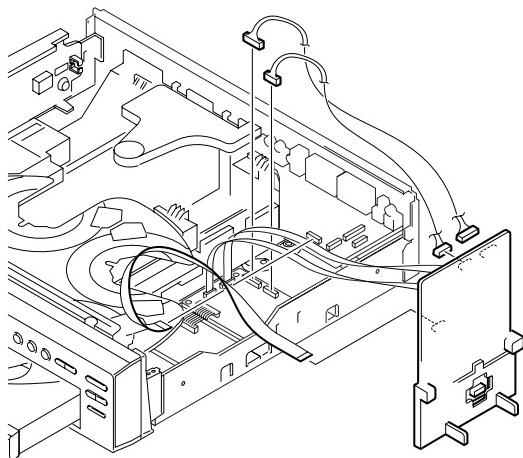


Fig. 12

- 7) Set is finished.

SECTION 1 GENERAL

This section is extracted from instruction manual (3-082-035-11).

About This Manual

- Instructions in this manual describe the controls on the remote. You can also use the controls on the player if they have the same or similar names as those on the remote.
- "DVD" may be used as a general term for DVD VIDEOs, DVD-RWs/DVD-Rs and DVD+RWs/DVD+Rs.
- The meanings of the icons used in this manual are described below:

Icon	Meaning
DVD-V	Functions available for DVD VIDEOs and DVD-RWs/DVD-Rs in video mode or DVD+RWs/DVD+Rs
DVD-RW	Functions available for DVD-RWs in VR (Video Recording) mode
VCD	Functions available for VIDEO CDs, Super VCDs or CD-R/CD-RWs in video CD format or Super VCD format
SA-CD	Functions available for Super Audio CDs
DATA CD	Functions available for DATA CDs (CD-ROMs/CD-Rs/CD-RWs containing MP3* audio tracks)
CD	Functions available for music CDs or CD-Rs/CD-RWs in music CD format

* MP3 (MPEG1 Audio Layer 3) is a standard format defined by ISO (International Standard Organization)/MPEG which compresses audio data.

This Player Can Play the Following Discs

Format of discs
DVD VIDEO (page 83)
DVD-RW (page 83)
Super Audio CD (page 84)
VIDEO CD
Music CD

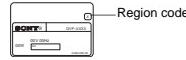
"DVD VIDEO" and "DVD-RW" are trademarks.

Region code

Your player has a region code printed on the back of the unit and only will play DVD VIDEO discs (playback only) labeled with identical region codes. This system is used to protect copyrights.

DVD VIDEOS labeled will also play on this player.

If you try to play any other DVD VIDEO, the message "Playback prohibited by area limitations." will appear on the TV screen. Depending on the DVD VIDEO, no region code indication may be labeled even though playing the DVD VIDEO is prohibited by area restrictions.



Example of discs that the player cannot play

- The player cannot play the following discs:
 - All CD-ROMs (including PHOTO CDs)/CD-Rs/CD-RWs other than those recorded in the following formats:
 - music CD format
 - video CD format
 - MP3 format that conforms to ISO9660® Level 1/Level 2, or its extended format, Joliet
 - Data part of CD-Extras
 - DVD-ROMs
 - DVD Audio discs

* A logical format of files and folders on CD-ROMs defined by ISO (International Standard Organization).

Also, the player cannot play the following discs:

- A DVD VIDEO with a different region code.
- A disc recorded in a color system other than NTSC, such as PAL or SECAM (this player conforms to the NTSC color system).
- A disc that has a non-standard shape (e.g., card, heart).
- A disc with paper or stickers on it.
- A disc that has the adhesive of cellophane tape or a sticker still left on it.

Notes

• Notes about DVD-RWs/DVD-Rs, DVD+RWs/DVD+Rs, or CD-Rs/CD-RWs

Some DVD-RWs/DVD-Rs, DVD+RWs/DVD+Rs, or CD-Rs/CD-RWs cannot be played on this player due to the recording quality or physical condition of the disc, or the characteristics of the recording device and authoring software.

The disc will not play if it has not been correctly finalized. Also, images in DVD-RWs with CPRM® protection may not be played if they contain a copy protection signal. "Copyright lock" appears on the screen. For more information, see the operating instructions for the recording device.

Note that discs created in the Packet Write format cannot be played.

* CPRM (Content Protection for Recordable Media) is a coding technology that protects copyright for images.

• Music discs encoded with copyright protection technologies

This product is designed to playback discs that conform to the Compact Disc (CD) standard. Recently, various music discs encoded with copyright protection technologies are marketed by some record companies. Please be aware that among those discs, there are some that do not conform to the CD standard and may not be playable by this product.

Note on playback operations of DVDs and VIDEO CDs

Some playback operations of DVDs and VIDEO CDs may be intentionally set by software producers. Since this player plays DVDs and VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. Also, refer to the instructions supplied with the DVDs or VIDEO CDs.

Copyrights

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents, other intellectual property rights owned by Macrovision Corporation, and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Notes About the Discs

- To keep the disc clean, handle the disc by its edge. Do not touch the surface.



- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as the temperature may rise considerably inside the car.

- After playing, store the disc in its case.
- Clean the disc with a cleaning cloth. Wipe the disc from the center out.

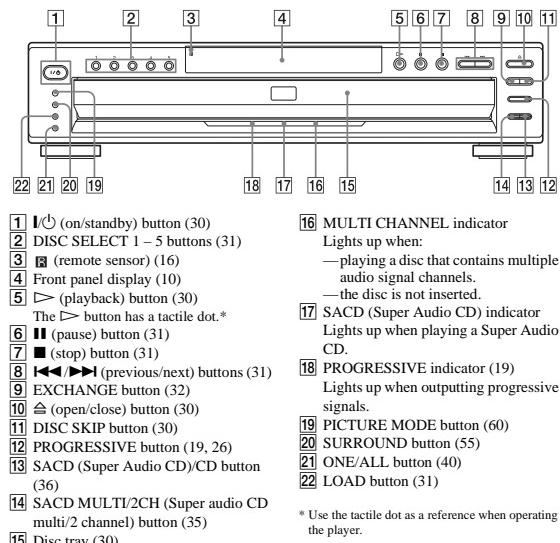


- Do not use solvents such as benzine, thinner, commercially available cleaners, or anti-static spray intended for vinyl LPs.

Index to Parts and Controls

For more information, refer to the pages indicated in parentheses.

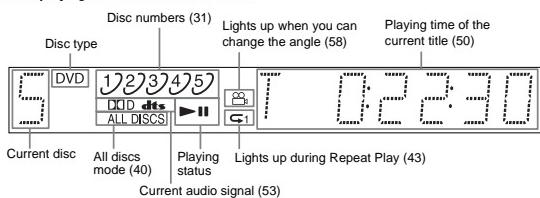
Front panel



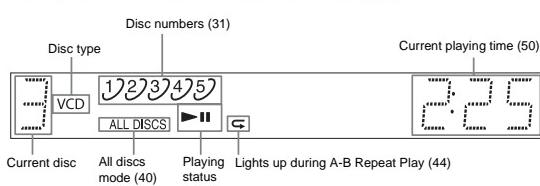
* Use the tactile dot as a reference when operating the player.

Front panel display

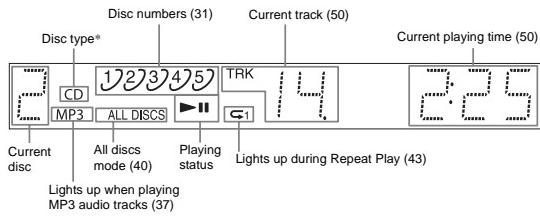
When playing back a DVD VIDEO/DVD-RW



When playing back a VIDEO CD with Playback Control (PBC) (36)

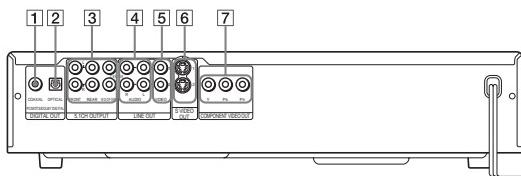


When playing back a CD, Super Audio CD, DATA CD (MP3 audio), or VIDEO CD (without PBC)



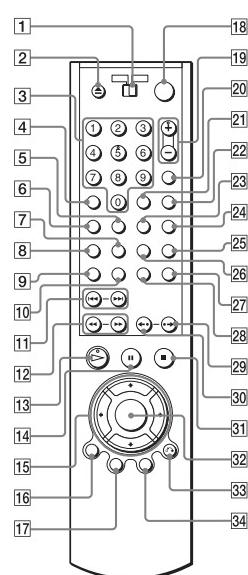
* When playing the HD layer of Super Audio CD discs, the disc type is not displayed.

Rear panel



- [1] DIGITAL OUT (COAXIAL) jack (22)
(23) (24)
- [2] DIGITAL OUT (OPTICAL) jack (22)
(23) (24)
- [3] 5.1CH OUTPUT jacks (24)
- [4] LINE OUT L/R (AUDIO) 1/2 jacks
(21) (22) (23)
- [5] LINE OUT (VIDEO) 1/2 jacks (17)
- [6] S VIDEO OUT 1/2 jacks (17)
- [7] COMPONENT VIDEO OUT (Y, Pb, Pr) jacks (17)

Remote

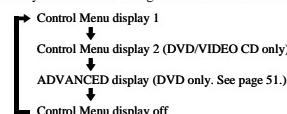


- [1] TV/DVD switch (68)
- [2] ▲ OPEN/CLOSE button (31)
- [3] Number buttons (34)
- The number 5 button has a tactile dot.*
- [4] CLEAR button (40)
- [5] SUBTITLE button (58)
- [6] AUDIO button (53)
- [7] REPEAT button (43)
- [8] SHUFFLE button (42)
- [9] SACD MULTI/2CH (Super audio CD multi/2 channel) button (35)
- [10] SACD (Super Audio CD)/CD button (36)
- [11] ▶◀▶ PREV/NEXT (previous/next) buttons (31)
- [12] ▶◀◀▶ SCAN/SLOW buttons (45)
- [13] ▶ PLAY button (30)
- The ▶ button has a tactile dot.*
- [14] ■ PAUSE button (31)
- [15] ↺/↖/↗/↖ buttons (34)
- [16] DISPLAY button (13)
- [17] TOP MENU button (34)
- [18] V(on/standby) button (30)
- [19] VOL (volume) +/- buttons (68)
- The + button has a tactile dot.*
- [20] TV/VIDEO button (68)
- [21] ENTER button
- [22] DISC SKIP button (30)
- [23] ANGLE button (58)
- [24] SUR (surround) button (55)
- [25] PICTURE MODE button (60)
- [26] A-B button (44)
- [27] PICTURE NAVI (picture navigation) button (48)
- [28] TIME/TEXT button (49)
- [29] ▶/■ INSTANT SEARCH/STEP button (31, 46)
- [30] ▶◀/■ INSTANT REPLAY/STEP button (31, 46)
- [31] ■ STOP button (31)
- [32] ENTER button (26)
- [33] ⌂ RETURN button (32)
- [34] MENU button (34) (37)

* Use the tactile dot as a reference when operating the player.

Guide to the Control Menu Display

Use the Control Menu to select a function and to view related information. Press DISPLAY repeatedly to turn on or change the Control Menu display as follows:

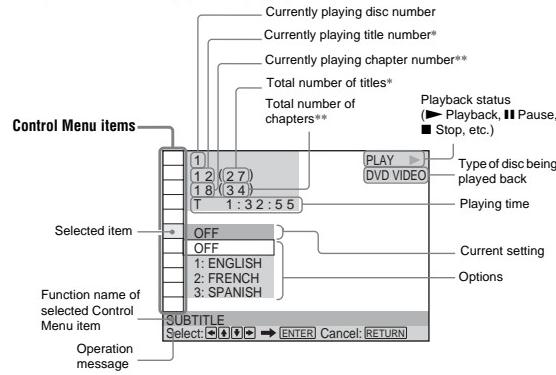


Hint
You can skip the ADVANCED display by setting "OFF" under "ADVANCED" in the Control Menu (page 51).

Control Menu Display

The Control Menu display 1 and 2 will show different items depending on the disc type. For details, please refer to the pages in parentheses.

Example: Control Menu display 1 when playing a DVD VIDEO.



* Displays the scene number for VIDEO CDs (PBC is on), track number for VIDEO CDs/Super Audio CDs/CDs, album number for DATA CDs.

** Displays the index number for VIDEO CDs/Super Audio CDs/CDs, MP3 audio track number for DATA CDs.

List of Control Menu Items

Item	Item Name, Function, Relevant Disc Type
	DISC (page 46) Selects the disc to be played. DVD-V DVD-RW VCD SR-CD CD DATA CD
	TITLE (page 46)/SCENE (page 46)/TRACK (page 46) Selects the title, scene, or track to be played. DVD-V DVD-RW VCD
	CHAPTER (page 46)/INDEX (page 46) Selects the chapter or index to be played. DVD-V DVD-RW VCD
	ALBUM (page 37) Selects the album to be played. DATA CD
	TRACK (page 46) Selects the track to be played. SR-CD CD DATA CD
	INDEX (page 46) Selects the index to be played. SR-CD CD
	ORIGINAL/PLAY LIST (page 34) Selects the type of titles (DVD-RW) to be played, the ORIGINAL one, or an edited PLAY LIST. DVD-RW
	TIME/TEXT (page 46) Checks the elapsed time and the remaining playback time. Input the time code for picture and music searching. Displays the DVD/Super Audio CD/CD text, or the DATA CD's track name. DVD-V DVD-RW VCD SR-CD CD DATA CD
	MULTI/2CH (page 35) Selects the playback area on Super Audio CDs when available. SR-CD
	AUDIO (page 53) Changes the audio setting. DVD-V DVD-RW VCD CD DATA CD
	SUBTITLE (page 58) Displays the subtitles. Changes the subtitle language. DVD-V DVD-RW
	ANGLE (page 58) Changes the angle. DVD-V
	SURROUND (page 55) Selects the surround functions. DVD-V DVD-RW VCD CD DATA CD
	ADVANCED (page 51) Displays the information (bit rate or layer) of the disc currently playing. DVD-V DVD-RW
	PARENTAL CONTROL (page 63) Set to prohibit playback on this player. DVD-V VCD SR-CD CD

	SETUP (page 70) QUICK Setup (page 26) Use Quick Setup to choose the desired language of the on-screen display, the aspect ratio of the TV, the audio output signal, and the size of the speakers you are using. CUSTOM Setup In addition to the Quick Setup setting, you can adjust various other settings. RESET Returns the settings in "SETUP" to the default setting. DVD-V DVD-RW VCD SR-CD CD DATA CD
	ALL DISCS/ONE DISC (page 40) Selects All Discs or One Disc mode. DVD-V DVD-RW VCD SR-CD CD DATA CD
	PROGRAM (page 40) Selects the disc, title, chapter, or track to play in the order you want. DVD-V VCD SR-CD CD
	SHUFFLE (page 42) Plays the disc, title, chapter, or track in random order. DVD-V DVD-RW VCD SR-CD CD DATA CD
	REPEAT (page 43) Plays the entire disc (all titles/all tracks/all albums) repeatedly or one title/chapter/track/album repeatedly. DVD-V DVD-RW VCD SR-CD CD DATA CD
	A-B REPEAT (page 44) Specifies the parts you want to play repeatedly. DVD-V DVD-RW VCD SR-CD CD
	BNR (page 59) Adjusts the picture quality by reducing the "block noise" or mosaic like patterns that appear on your TV screen. DVD-V DVD-RW VCD
	CUSTOM PICTURE MODE (page 60) Adjusts the video signal from the player. You can select the picture quality that best suits the program you are watching. DVD-V DVD-RW VCD
	DIGITAL VIDEO ENHANCER (page 62) Exaggerates the outline of the image to produce a sharper picture. DVD-V DVD-RW VCD
	PICTURE NAVIGATION (page 48) Divides the screen into 9 subscreens to help you find the scene you want quickly. DVD-V VCD

Hint
The Control Menu icon indicator lights up in green when you select any item except "OFF." ("SURROUND," "PROGRAM," "SHUFFLE," "REPEAT," "A-B REPEAT," "BNR," "DIGITAL VIDEO ENHANCER" only). The "ANGLE" indicator lights up in green only when the angles can be changed. The "CUSTOM PICTURE MODE" indicator lights up in green when any setting other than "STANDARD" is selected.

Hookups

Hooking Up the Player

Follow steps 1 to 6 to hook up and adjust the settings of the player.

Notes

- Plug cords securely to prevent unwanted noise.
- Refer to the instructions supplied with the components to be connected.
- You cannot connect this player to a TV that does not have a video input jack.
- Be sure to disconnect the power cord of each component before connecting.

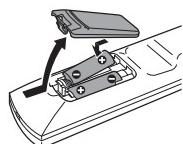
Step 1: Unpacking

Check that you have the following items:

- Audio/video cord (pinplug × 3 → pinplug × 3) (1)
- Remote commander (remote) (1)
- Size AA (R6) batteries (2)

Step 2: Inserting Batteries Into the Remote

You can control the player using the supplied remote. Insert two Size AA (R6) batteries by matching the \oplus and \ominus ends on the batteries to the markings inside the compartment. When using the remote, point it at the remote sensor on the player.

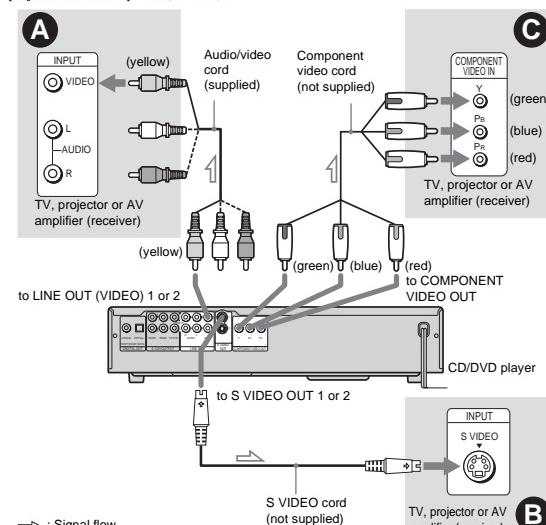


Notes

- Do not leave the remote in an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct light from the sun or a lighting apparatus. Doing so may cause a malfunction.
- If you do not use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

Step 3: Connecting the Video Cords

Connect this player to your TV monitor, projector, or AV amplifier (receiver) using a video cord. Select one of the patterns A through C, according to the input jack on your TV monitor, projector, or AV amplifier (receiver).



A If you are connecting to a video input jack

Connect the yellow plug of the audio/video cord (supplied) to the yellow (video) jacks. You will enjoy standard quality images.



Use the red and white plugs to connect to the audio input jacks (page 21). (Do this if you are connecting to a TV only.)

B If you are connecting to an S VIDEO input jack

Connect an S VIDEO cord (not supplied). You will enjoy high quality images.



C If you are connecting to a monitor, projector, or AV amplifier (receiver) having component video input jacks (Y, Pb, Pr)

Connect the component via the COMPONENT VIDEO OUT jacks using a component video cord (not supplied) or three video cords (not supplied) of the same kind and length. You will enjoy accurate color reproduction and high quality images. If your TV accepts progressive (480p) format signals, you must use this connection and then press PROGRESSIVE on the front panel to accept progressive video signals. See "Using the PROGRESSIVE button" on the next page for more information.

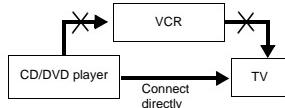


When connecting to a wide screen TV

Depending on the disc, the image of some discs may not fit your TV screen. If you want to change the aspect ratio, please refer to page 72.

Notes

- Connect the player directly to the TV. If you pass the player signals via the VCR, you may not receive a clear image on the TV screen.



- Consumers should note that not all high definition television sets are fully compatible with this product and may cause artifacts to be displayed in the picture. In the case of 480 progressive scan picture problems, it is recommended that you switch the connection to the standard definition output. If there are questions regarding your Sony TV set's compatibility with this model DVD player, please contact our customer service center.

Step 4: Connecting the Audio Cords

Refer to the chart below to select the connection that best suits your system. Be sure to also read the instructions for the components you wish to connect.

Select a connection

Select one of the following connections, **A** through **D**.

Components to be connected	Connection	Your setup (example)
TV • Surround effects: TVS DYNAMIC (page 55), TVS WIDE (page 55)	A (page 21)	
Stereo amplifier (receiver) and two speakers • Surround effects: TVS STANDARD (page 56) or MD deck/DAT deck • Surround effects: None	B (page 22)	
AV amplifier (receiver) having a Dolby® Surround (Pro Logic) decoder and 3 to 6 speakers • Surround effects: Dolby Surround (Pro Logic) (page 83)	C (page 23)	
AV amplifier (receiver) with 5.1 ch input jacks and 4 to 6 speakers • Surround effects: – Dolby Digital (5.1 ch) (page 83) – DTS (5.1 ch) (page 83) – Super Audio CD Multi channel (page 84) or AV amplifier (receiver) with digital input jacks having a Dolby or DTS** decoder and 6 speakers • Surround effects: – Dolby Digital (5.1ch) (page 83) – DTS (5.1ch) (page 83)	D (page 24)	

Hint

If you connect an AV amplifier (receiver) that conforms to the 96 kHz sampling frequency, use connection **D**.

* Manufactured under license from Dolby Laboratories. "Dolby," "Pro Logic," and the double-D symbol are trademarks of Dolby Laboratories.

** "DTS" and "DTS Digital Surround" are registered trademarks of Digital Theater Systems, Inc.

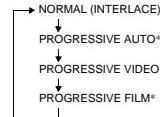
Using the PROGRESSIVE button

You can fine-tune the Progressive 480p video signal output when you press PROGRESSIVE on the front panel (the PROGRESSIVE indicator lights up in blue) and connect the player using the COMPONENT VIDEO OUT jacks to a TV that is able to accept the video signal in progressive format.

◆ Conversion modes

DVD software can be divided into two types: film based software and video based software. Video based software is derived from the TV, such as dramas and sit-coms, and displays images at 30 frames/60 fields per second. Film based software is derived from film and displays images at 24 frames per second. Some DVD software contains both Video and Film. In order for these images to appear natural on your screen when output in PROGRESSIVE mode (60 frames per second), the progressive video signal needs to be converted to match the type of DVD software that you are watching.

Press PROGRESSIVE repeatedly to turn on or change the displays as follows:



* Appears as NORMAL, P AUTO, P VIDEO, or P FILM on the front panel display

• NORMAL (INTERLACE)

Select this when you are connected to a standard (Interlace format) TV.

• PROGRESSIVE AUTO

Select this when you are connected to a progressive TV. This will automatically detect if you are playing Film based or Video based software and convert the signal to the appropriate conversion mode. Normally select this position when you are connected to a progressive TV.

• PROGRESSIVE VIDEO

Select this when you are connected to a progressive TV. This will set the conversion mode for Video based software, regardless of the type of software that you are playing.

• PROGRESSIVE FILM

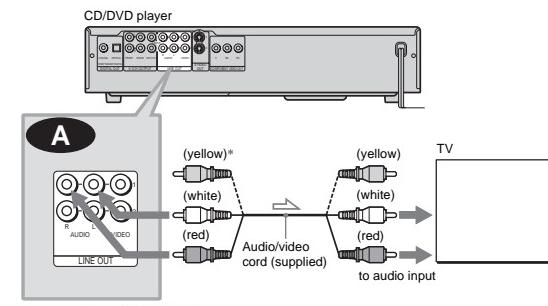
Select this when you are connected to a progressive TV. This will set the conversion mode for Film based software, regardless of the type of software that you are playing.

Notes

- When you select PROGRESSIVE FILM, the progressive format images may become unclear or unnatural. If this happens, select PROGRESSIVE VIDEO.
- When you play video based software with progressive signals, sections of some types of images may appear unnatural due to the conversion process when output through the COMPONENT VIDEO OUT jacks. Images from the S VIDEO OUT 1/2 and LINE OUT (VIDEO) 1/2 jacks are unaffected as they are output in the normal (interlace) format.

A Connecting to your TV

This connection will use your TV speakers for sound.



→ : Signal flow

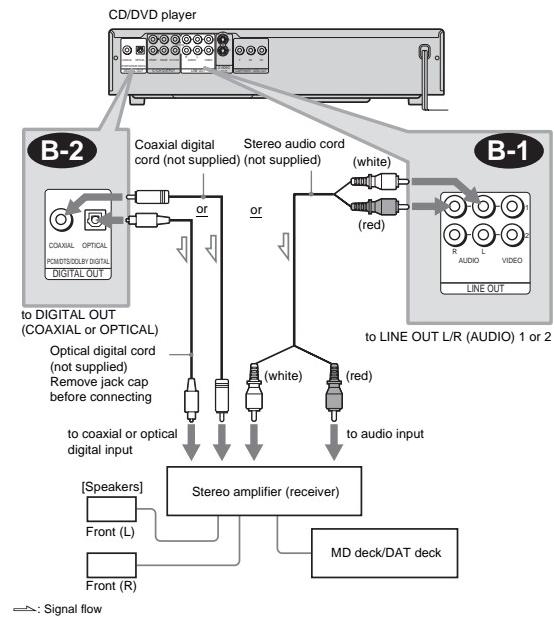
* The yellow plug is used for video signals (page 17).

Hint

When connecting to a monaural TV, use a stereo-mono conversion cord (not supplied). Connect the LINE OUT L/R (AUDIO) 1/2 jacks to the TV's audio input jack.

B Connecting to a stereo amplifier (receiver) and 2 speakers/Connecting to an MD deck or DAT deck

If the stereo amplifier (receiver) has audio input jacks L and R only, use **B-1**. If the amplifier (receiver) has a digital input jack, or when connecting to an MD deck or DAT deck, use **B-2**. In this case, you can also connect the player directly to the MD deck or DAT deck without using your stereo amplifier (receiver).



Hint

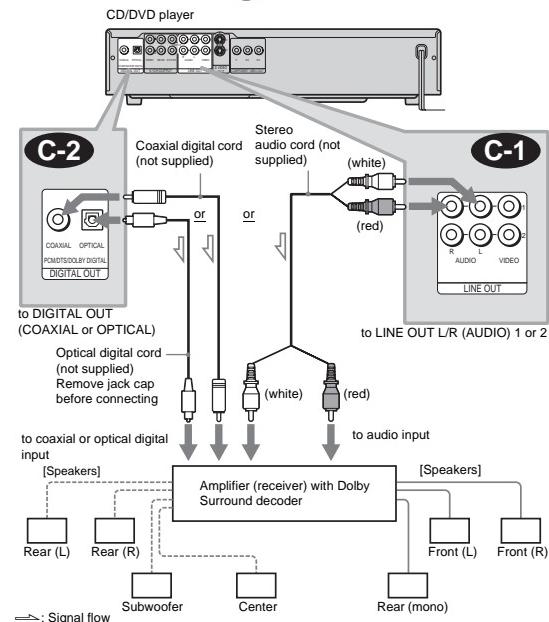
To realize better surround sound effects, make sure that your listening position is in between your speakers.

Note

Super Audio CD audio signals are not output from the digital jack.

C Connecting to an AV amplifier (receiver) having a Dolby Surround (Pro Logic) decoder and 3 to 6 speakers

You can enjoy the Dolby Surround effects only when playing Dolby Surround audio or multi-channel audio (Dolby Digital) discs. If your amplifier (receiver) has L and R audio input jacks only, use **C-1**. If your amplifier (receiver) has a digital input jack, use **C-2**.



Hint

For correct speaker location, refer to the operating instructions of the amplifier (receiver).

Notes

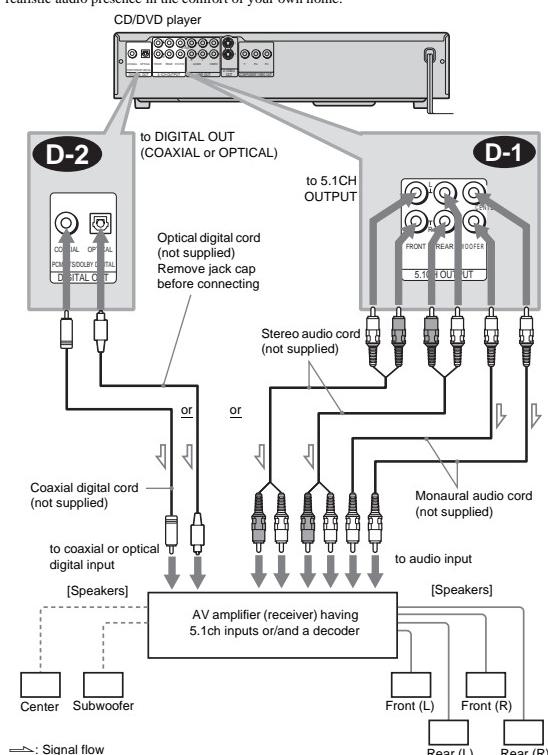
- When connecting 6 speakers, replace the monaural rear speaker with a center speaker, 2 rear speakers and a subwoofer.
- Super Audio CD audio signals are not output from the digital jack.

→ continued 23

D Connecting to an AV amplifier (receiver) with 5.1ch input jacks and/or a digital input jack and 4 to 6 speakers

If your AV amplifier (receiver) has 5.1 channel inputs, use **D-1**.

If you want to use the Dolby Digital or DTS decoder function on your AV amplifier (receiver), connect to its digital jack using **D-2**. With the following connections, you can enjoy a more realistic audio presence in the comfort of your own home.



D-1 : Connecting to the 5.1ch input jacks

You can enjoy 5.1ch surround sound using the internal Dolby Digital, DTS, or Super Audio CD Multi decoder of this player. You can also enjoy Dolby Surround (Pro Logic) sounds, or surround sounds using various "SURROUND" modes (page 55).

D-2 : Connecting to a digital jack

This connection will allow you to use the Dolby Digital or DTS decoder function of your AV amplifier (receiver). You are not able to enjoy the surround sound effects of this player.

Hints

- For correct speaker placement, refer to the instructions of the connected components.
- To enhance the sound performance:
 - Use high-performance speakers.
 - Use front, rear, and center speakers of the same size and performance.
 - Place the subwoofer between the left and right front speakers.
- Use connection **D-2** when connecting to 7 or more speakers (6.1 ch or more).

Notes

For connection **D-2**

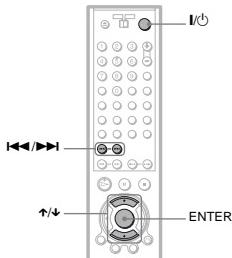
- After you have completed the connection, be sure to set "DOLBY DIGITAL" to "DOLBY DIGITAL" and "DTS" to "DTS" in Quick Setup (page 26).
- When you connect an amplifier (receiver) that conforms to the 96kHz sampling frequency, set "48kHz/96kHz PCM" in "AUDIO SETUP" to "96kHz/24bit" (page 76).
- Super Audio CD audio signals are not output from the digital jack.

Step 5: Connecting the Power Cord

Plug the player and TV power cords into an AC outlet.

Step 6: Quick Setup

Follow the steps below to make the minimum number of basic adjustments for using the player. To skip an adjustment, press **▶▶**. To return to the previous adjustment, press **◀◀**.



1 Turn on the TV.

2 Press **I/O**.

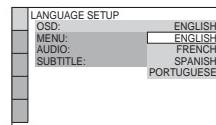
Press PROGRESSIVE on the front panel only if you have made video connection **C** (page 17) and wish to view progressive video signals. The PROGRESSIVE indicator lights up in blue when the player outputs progressive signal.

3 Switch the input selector on your TV so that the signal from the player appears on the TV screen.

"Press [ENTER] to run QUICK SETUP" appears at the bottom of the screen. If this message does not appear, select "QUICK" under "SETUP" in the Control Menu to run Quick Setup (page 71).

4 Press ENTER without inserting a disc.

The Setup Display for selecting the language used in the on-screen display appears.



5 Press **↑/↓** to select a language.

The player uses the language selected here to display the menu and subtitles as well.

26

12 Press **↑/↓** to select the type of DTS signal sent to your amplifier (receiver).

Choose the item that matches the audio connection you selected on pages 22 to 24 (**B** through **D**).

B-2 C-2 • D-PCM (page 76)

D-2 • DTS (only if the amplifier (receiver) has a DTS decoder) (page 76)

13 Press ENTER.

◆ When "DIGITAL OUTPUT" is selected in step 9

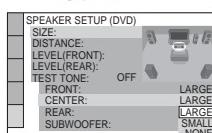
• Quick Setup is finished and connections are complete.

◆ When "DIGITAL & 5.1CH OUTPUT" is selected in step 9

• The Setup Display for "SPEAKER SETUP" appears.

14 Press **↑/↓** to select the size of the center speaker.

If no center speaker is connected, select "NONE" (page 77).



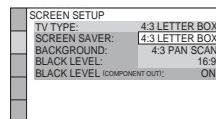
15 Press ENTER.

"REAR" is selected.



6 Press ENTER.

The Setup Display for selecting the aspect ratio of the TV to be connected appears.

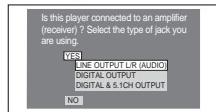


7 Press **↑/↓** to select the setting that matches your TV type.

- ◆ If you have a 4:3 standard TV
 - 4:3 LETTER BOX or 4:3 PAN SCAN (page 72)
- ◆ If you have a wide-screen TV or a 4:3 standard TV with a wide-screen mode
 - 16:9 (page 72)

8 Press ENTER.

The Setup Display for selecting the type of jack used to connect your amplifier (receiver) appears.



9 Press **↑/↓** to select the type of jack (if any) you are using to connect to an amplifier (receiver), then press ENTER.

Choose the item that matches the audio connection you selected on pages 21 to 24 (**A** through **D**).

- A**
 - If you connect just a TV and nothing else, select "NO." Quick Setup is finished and connections are complete.
- B-1 C-1**
 - Select "LINE OUT L/R (AUDIO)." Quick Setup is finished and connections are complete.

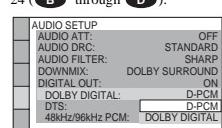
10 Press **↑/↓** to select the type of jack you wish to send to your amplifier (receiver).

- B-2 C-2 D-2**
 - Select "DIGITAL OUTPUT." The Setup Display for "DOLBY DIGITAL" appears.

- B-1 or both B-1 and C-2**
 - Select "DIGITAL & 5.1CH OUTPUT." The Setup Display for "DOLBY DIGITAL" appears.

11 Press **↑/↓** to select the type of Dolby Digital signal you wish to send to your amplifier (receiver).

Choose the signal that matches the audio connection you selected on pages 22 to 24 (**B** through **D**).



12 Press **↑/↓** to select the type of jack you are using.

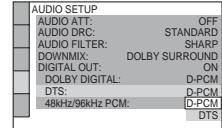
The Setup Display for selecting the type of jack you are using appears.

- B-2 C-2**
 - D-PCM (page 76)

- D-2**
 - DOLBY DIGITAL (only if the amplifier (receiver) has a Dolby Digital decoder) (page 76)

13 Press ENTER.

"DTS" is selected.



Hints

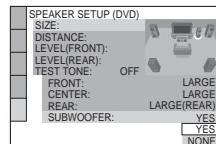
Hints

16 Press **↑/↓** to select the size of the rear speakers.

If no rear speaker is connected, select "NONE." "SIDE" and "REAR" refer to the speaker position relative to your listening position (page 77).

17 Press ENTER.

"SUBWOOFER" is selected.



18 Press **↑/↓** to select whether or not you have connected a subwoofer.

19 Press ENTER.

Quick Setup is finished. All connections and setup operations are complete.

D-1

- Set "DISTANCE," "LEVEL (FRONT)," and "LEVEL (REAR)" according to the connected speakers (page 78).

💡 Hints

- For connections **B-1 C-1 D-1**
 - If the sound distorts even when the volume is turned down, set "AUDIO ATT" to "ON" (page 75).

- For connections **B-2 C-2 D-2**
 - If you connect an amplifier (receiver) that conforms to the 96 kHz sampling frequency (page 76).

- The speaker size you set in steps 14 through 18 will also adjust the Super Audio CD speaker size of "SPEAKER SETUP." If you want to change the speaker size for Super Audio CDs, you can set it in "SPEAKER SETUP" (page 77).

Enjoying the surround sound effects

To enjoy the surround sound effects of this player or your amplifier (receiver), set the following items as described below for the audio connection you selected on pages 22 to 24 (**B** through **D**). Each of these is the default setting and does not need to be adjusted when you first connect the player. Refer to page 70 for using the Setup Display.

Audio Connection (pages 21 to 24)

- A**
 - No additional settings are needed.
- B-1 C-1**
 - Set "DOWNMIX" to "DOLBY SURROUND" (page 75).
- B-2 C-2 D-2**
 - Set "DOWNMIX" to "DOLBY SURROUND" (page 75).
 - Set "DIGITAL OUT" to "ON" (page 75).

→ continued 27

Using the DVD's Menu

DVD-V

A DVD is divided into long sections of a picture or a music feature called "titles." When you play a DVD which contains several titles, you can select the title you want using the TOP MENU button. When you play DVDs that allow you to select items such as the language for the subtitles and the language for the sound, select these items using the MENU button.

Selecting an album and track

1 Press MENU.

The list of MP3 albums recorded on the DATA CD appears.



2 Select an album using ↑/↓ and press ENTER.

The list of tracks contained in the album appears.



3 Select a track using ↑/↓ and press ENTER.

The selected track starts playing. When a track or album is being played, its title is shaded.

To go to the next or previous page

Press → or ←.

To return to the previous display

Press ⌂ RETURN.

To turn off the display

Press MENU.

Notes

- Only the letters in the alphabet and numbers can be used for album or track names. Anything else is displayed as “*.”
- ID3 tags cannot be displayed.

About MP3 audio tracks

You can play MP3 audio tracks on CD-ROMs or CD-Rs/CD-RWs. However, the discs must be recorded according to ISO9660 level 1, level 2, or Joliet format for the player to recognize the tracks.

You can also play discs recorded in Multi Session. See the instructions of the CD-R/CD-RW device or recording software (not supplied) for details on the recording format.

To play a Multi Session CD

This player can play Multi Session CDs when an MP3 audio track is located in the first session. Any subsequent MP3 audio tracks, recorded in the later sessions, can also be played back.

When audio tracks and images in music CD format or video CD format are recorded in the first session, only the first session will be played back.

Notes

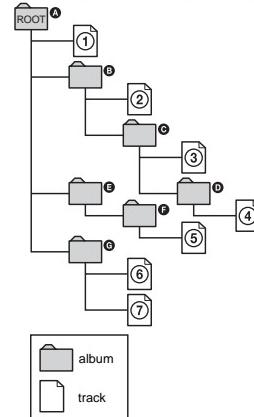
- If you put the extension “.MP3” to data not in MP3 format, the player cannot recognize the data properly and will generate a loud noise which could damage your speaker system.
- The player cannot play audio tracks in MP3PRO format.

The playback order of MP3 audio tracks

The playback order of albums and tracks recorded on a DATA CD is as follows.

◆Structure of disc contents

Tree 1 Tree 2 Tree 3 Tree 4 Tree 5



Notes

- Depending on the software you use to create the DATA CD, the playback order may differ from the illustration above.
- The playback order above may not be applicable if there are more than a total of 999 albums and tracks in the DATA CD.
- The player can recognize up to 499 albums (the player will count just albums, including albums that do not contain MP3 audio tracks). The player will not play any albums beyond the first 499 albums. Of the first 499 albums, the player will play no more than a combined total of 999 albums and tracks.

Various Play Mode Functions (Program Play, Shuffle Play, Repeat Play, A-B Repeat Play)

You can set the following play modes:

- Program Play (page 40)
- Shuffle Play (page 42)
- Repeat Play (page 43)
- A-B Repeat Play (page 44)

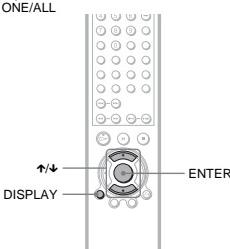
Notes

- The play mode is canceled when:
 - you open the disc tray.
 - the player enters standby mode by pressing 1 ().
- Before setting a play mode for Super Audio CDs, select the playback layer or area you want to listen to (page 35). Each play mode function works only within the selected layer or playback area.

Selecting the disc mode (One Disc or All Discs)

DVD-V DVD-RW VCD SA-CD CD DATA CD

You can play one disc or all of the discs in the player. Before setting Program Play, Shuffle Play, or Repeat Play, you must select whether to set those play mode on one disc or all of the discs.

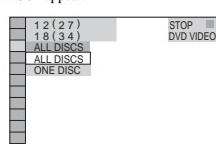


1 Press DISPLAY once or twice.

The Control Menu appears.

2 Press ↑/↓ to select () (ALL DISCS/ONE DISC) and press ENTER.

The options for “ALL DISCS/ONE DISC” appear.



3 Press ↑/↓ to select the item.

- ALL DISCS: continuously plays all discs.
- ONE DISC: plays the selected disc.

4 Press ENTER.

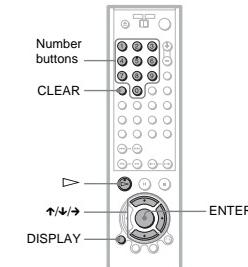
Hint

You can also select “ALL DISCS” or “ONE DISC” by pressing ONE/ALL button on the player. Each time you press the button, the disc mode changes alternately.

Creating your own program (Program Play) DVD-V VCD SA-CD CD

You can play the contents of a disc in the order you want by arranging the order of the titles, chapters, or tracks on the disc to create your own program.

You can program up to 99 items. By selecting All Discs mode (page 40), you can create a program for all of the discs in the player.

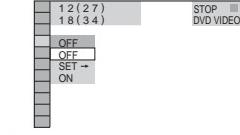


1 Press DISPLAY twice.

The Control Menu appears.

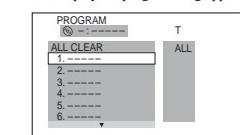
2 Press ↑/↓ to select () (PROGRAM), then press ENTER.

The options for “PROGRAM” appear.



3 Press ↑/↓ to select “SET →,” then press ENTER.

The display for programming appears.

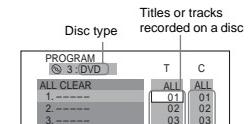
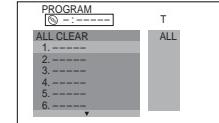


4 Press →.

The player is ready to program the first disc.

5 Select the disc you want to program using the number buttons or ↑/↓, then press ENTER.

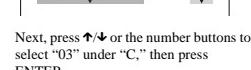
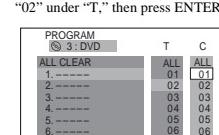
The cursor moves to the title or track row “T” (in this case, “01”).



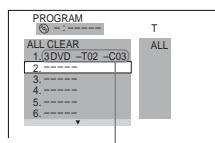
6 Select the title, chapter, or track you want to program.

◆ When playing a DVD VIDEO
For example, select chapter “03” of title “02.”

Press ↑/↓ or the number buttons to select “02” under “T,” then press ENTER.



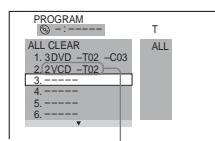
Next, press ↑/↓ or the number buttons to select “03” under “C,” then press ENTER.



Selected disc, title, and chapter

◆ When playing a VIDEO CD, Super Audio CD, or CD

For example, select track "02." Press $\uparrow\downarrow$ or the number buttons to select "02" under "T," then press ENTER. The track number may be displayed in 3 digits for a Super Audio CD.



Selected disc and track

7 To program other discs, titles, chapters, or tracks, repeat steps 4 to 6.

The programmed discs, titles, chapters, and tracks are displayed in the selected order.

8 Press \triangleright to start Program Play.

Program Play begins.

When the program ends, you can restart the same program again by pressing \triangleright .

To return to normal play

Press CLEAR, or select "OFF" in step 3.

To turn off the display

Press DISPLAY repeatedly until the display is turned off.

To change or cancel a program

1 Follow steps 1 through 3 of "Creating your own program (Program Play)."

2 Select the program number of the disc, title, chapter, or track you want to cancel or change using $\uparrow\downarrow$.

3 To cancel the program, press CLEAR. To change the program, follow steps 4 through 6 for new programming.

To cancel all the discs, titles, chapters, or tracks in the programmed order

1 Follow steps 1 through 3 of "Creating your own program (Program Play)."

2 Press \uparrow and select "ALL CLEAR."

3 Press ENTER.

Hint

You can do Repeat Play or Shuffle Play of the programmed titles, chapters, or tracks. During Program Play, follow the steps of "Repeat Play" (page 43) or "Shuffle Play" (page 42).

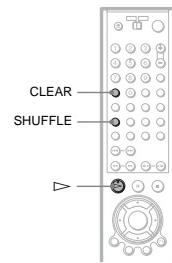
Notes

- You cannot use this function with VIDEO CDs with PBC playback.
- When playing Super VCDs, the total time of the programmed tracks does not appear on the screen.

Playing in random order (Shuffle Play) **DVD-V DVD-RW VCD SR-CD CD DATA CD**

DATAPAD

You can have the player "shuffle" titles, chapters, or tracks. Subsequent "shuffling" may produce a different playing order. By selecting All Discs mode (page 40), you can shuffle all of the discs in the player.



◆ When playing a DATA CD (MP3 audio)

- DISC: repeats all of the albums on the current disc in One Disc mode, or all of the discs in All Discs mode.
- ALBUM: repeats the current album.
- TRACK: repeats the current track.

◆ When Program Play or Shuffle Play is activated

- ON: repeats Program Play or Shuffle Play.

To return to normal play

Press CLEAR, or select "OFF" in step 2.

Hints

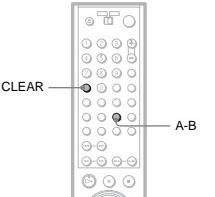
- You can set Repeat Play while the player is stopped. After selecting the "REPEAT" option, press \triangleright . Repeat Play starts.
- You can also select "REPEAT" from the Control Menu (page 13).

Note

You cannot use this function with VIDEO CDs with PBC playback.

Repeating a specific portion (A-B Repeat Play) **DVD-V DVD-RW VCD SR-CD CD**

You can play a specific portion of a title, chapter or track repeatedly. (This function is useful when you want to memorize lyrics, etc.)



1 During playback, when you find the starting point (point A) of the portion to be played repeatedly, press A-B.

The starting point (point A) is set.

2 When you reach the ending point (point B), press A-B again.

The set points are displayed and the player starts repeating this specific portion.

To return to normal play

Press CLEAR.

Hint

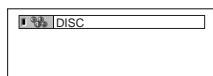
You can also select "A-B REPEAT" from the Control Menu (page 13).

Notes

- When you set A-B Repeat Play, the settings for Shuffle Play, Repeat Play, and Program Play are canceled.
- A-B Repeat Play does not work for titles containing still pictures on a DVD-RW in VR mode.
- A-B Repeat Play does not work across multiple titles ("ORIGINAL" or "PLAY LIST") on a DVD-RW in VR mode.

1 Press SHUFFLE during playback.

The following display appears.



2 Press SHUFFLE repeatedly to select the item to be shuffled.

◆ When playing a DVD VIDEO

- DISC*

- TITLE

- CHAPTER

◆ When playing a VIDEO CD, Super Audio CD, or CD

- DISC*

- TRACK

◆ When playing a DVD-RW or DATA CD

- DISC*

◆ When Program Play is activated

- ON: shuffles titles, chapters, or tracks selected in Program Play.

* You can select "DISC" in All Discs mode only.

To return to normal play

Press CLEAR, or select "OFF" in step 2.

Hints

- You can set Shuffle Play while the player is stopped. After selecting the "SHUFFLE" option, press \triangleright . Shuffle Play starts.
- Up to 96 chapters in a disc can be played in random order when "CHAPTER" is selected.
- You can also select "SHUFFLE" from the Control Menu (page 13).

Note

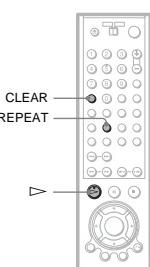
You cannot use this function with VIDEO CDs with PBC playback.

Playing repeatedly (Repeat Play)

DVD-V DVD-RW VCD SR-CD CD DATA CD

You can play all of the titles, albums, or tracks on a disc or a single title, chapter, album, or track repeatedly.

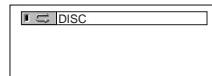
You can use a combination of Shuffle or Program Play modes. By selecting All Discs mode (page 40), you can repeat all of the discs in the player.



Playing Discs

1 Press REPEAT during playback.

The following display appears.



2 Press REPEAT repeatedly to select the item to be repeated.

◆ When playing a DVD VIDEO

- DISC: repeats all of the titles on the current disc in One Disc mode, or all of the discs in All Discs mode.

- TITLE: repeats the current title on a disc.

- CHAPTER: repeats the current chapter.

◆ When playing a DVD-RW

- DISC: repeats all of the titles on the selected type in One Disc mode, or all of the discs in All Discs mode.

- TITLE: repeats the current title on a disc.

- CHAPTER: repeats the current chapter.

◆ When playing a VIDEO CD, Super Audio CD, or CD

- DISC: repeats all of the tracks on the current disc in One Disc mode, or all of the discs in All Discs mode.

- TRACK: repeats the current track.

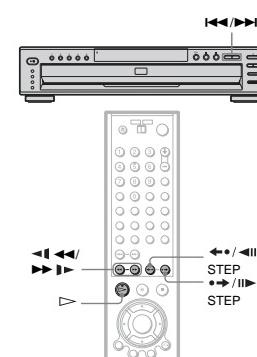
Locating a point quickly by playing a disc in fast forward or fast reverse (Scan) **DVD-V DVD-RW VCD SR-CD CD DATA CD**

Searching for a Scene

Searching for a Particular Point on a Disc (Scan, Slow-motion Play)

Search, Freeze Frame

You can quickly locate a particular point on a disc by monitoring the picture or playing back slowly.



Searching for a Scene

Press \ll or \gg while playing a disc. When you find the point you want, press \triangleright to return to normal speed.

Each time you press \ll or \gg during scan, the playback speed changes.

With each press the indication changes as shown below. Actual speeds may differ with some discs.

Playback direction

$\gg \gg \gg$ (DVD VIDEO/DVD-RW/VIDEO CD only)
 $\gg \gg$ (DVD VIDEO/Super Audio CD/CD only)

Opposite direction

$\ll \ll \ll$ (DVD VIDEO/DVD-RW/VIDEO CD only)
 $\ll \ll$ (DVD VIDEO only)

The " $\gg \gg$ "/" $\gg \gg$ " playback speed is about twice the normal speed. The " $\gg \gg \gg$ "/" $\gg \gg \gg$ " playback speed is faster than the " $\gg \gg$ "/" $\gg \gg$ ". The " $\gg \gg \gg$ " playback speed is faster than the " $\gg \gg$ "/" $\gg \gg$ ". The " $\gg \gg \gg$ " playback speed is faster than the " $\gg \gg$ "/" $\gg \gg$ ".

Note

Depending on the DVD/VIDEO CD, you may not be able to do some of the operations described.

Watching frame by frame (Slow-motion play) **DVD-V DVD-RW VCD**

Press $\ll\ll$ or $\gg\gg$ when the player is in pause mode. To return to the normal speed, press \gg .

Each time you press $\ll\ll$ or $\gg\gg$ during Slow-motion play, the playback speed changes. Two speeds are available. With each press the indication changes as follows:

Playback direction
SLOW2 $\gg\gg$ $\ll\ll$ SLOW1 $\gg\gg$

Opposite direction (DVD only)
SLOW2 $\ll\ll$ $\gg\gg$ SLOW1 $\ll\ll$

The "SLOW2 $\gg\gg$ "/"SLOW2 $\ll\ll$ " playback speed is slower than "SLOW1 $\gg\gg$ "/"SLOW1 $\ll\ll$ ".

Locating a point quickly using the PREV (previous) / Next (next) button (Search) **DVD-V DVD-RW VCD SA-CD CD DATA CD**

You can search for a particular point on a disc using $\ll\ll\gg\gg$ on the player.

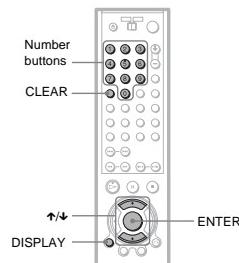
During playback, press and hold $\gg\gg$ on the player to locate a point in the playback direction, or press and hold $\ll\ll$ to locate a point in the opposite direction. When you find the point you want, release the button to return to normal playback speed.

Playing one frame at a time (Freeze Frame) **DVD-V DVD-RW VCD**

When the player is in the pause mode, press $\gg\gg$ / \gg STEP to go to the next frame. Press $\ll\ll$ / \ll STEP to go to the preceding frame (DVD only). If you hold the button down, you can view the frames in succession. To return to normal playback, press \gg .

Searching for a Title/Chapter/Track/Scene, etc. **DVD-V DVD-RW VCD SA-CD CD DATA CD**

You can search a DVD by title or chapter, and you can search a VIDEO CD/Super Audio CD/CD by track, index, or scene. As titles and DATA CD tracks are assigned unique numbers on the disc, you can select the desired one by entering its number. Or, you can search for a scene using the time code.



1 Press DISPLAY.

The Control Menu appears.

2 Press $\uparrow\downarrow$ to select the search method.

- ◆ When playing a DVD VIDEO/DVD-RW
 - DISC
 - TITLE
 - CHAPTER
 - TIME/TEXT
- Select "TIME/TEXT" to search for a starting point by inputting the time code.

- ◆ When playing a VIDEO CD without PBC Playback
 - DISC
 - TRACK
 - INDEX

◆ When playing a VIDEO CD with PBC Playback

- DISC
- SCENE
- INDEX

◆ When playing a Super Audio CD/CD

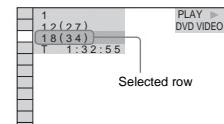
- DISC
- TRACK
- INDEX

◆ When playing a DATA CD (MP3 audio)

- DISC
- ALBUM
- TRACK

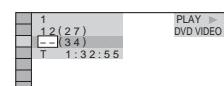
Example: when you select CHAPTER

"** (**)" is selected (** refers to a number). The number in parentheses indicates the total number of titles, chapters, tracks, indexes or scenes.



3 Press ENTER.

"** (**)" changes to "-- (**)."



4 Press $\uparrow\downarrow$ or the number buttons to select the title, chapter, track, index, or scene number you want to search.

If you make a mistake

Cancel the number by pressing CLEAR, then select another number.

5 Press ENTER.

The player starts playback from the selected number.

To search for a scene using the time code (DVD VIDEO/DVD-RW only)

- In step 2, select TIME/TEXT. "T **:**:**" (playing time of the current title) is selected.

- Press ENTER. "T **:**:**" changes to "T --:--:--."

- Input the time code using the number buttons, then press ENTER. For example, to find the scene at 2 hours, 10 minutes, and 20 seconds after the beginning, just enter "2:10:20."

Hints

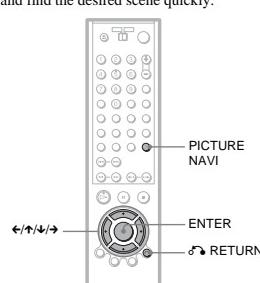
- You can search for a chapter (DVD VIDEO/DVD-RW) or track (CD/Super Audio CD/DATA CD) by pressing the number buttons and ENTER.
- You can display the first scene of titles, chapters or tracks recorded on the disc on a screen divided into 9 sections. You can start playback directly by selecting one of the scenes. For details, see "Searching by Scene (PICTURE NAVIGATION)" (page 48).

Notes

- You cannot search for a scene on a DVD+RW using the time code.
- The title, chapter or track number displayed is the same number recorded on the disc.
- You cannot search for a still picture on a DVD-RW in VR mode.

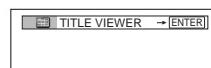
Searching by Scene (PICTURE NAVIGATION) **DVD-V VCD**

You can divide the screen into 9 subscreens and find the desired scene quickly.



1 Press PICTURE NAVI during playback.

The following display appears.



2 Press PICTURE NAVI repeatedly to select the item.

Refer to the explanations given for each item in the following sections.

- TITLE VIEWER (for DVD VIDEO only)
- CHAPTER VIEWER (for DVD VIDEO only)
- TRACK VIEWER (for VIDEO CD only)

3 Press ENTER.

To return to normal play
Press \rightarrow RETURN.

Hint

You can also select "PICTURE NAVIGATION" from the Control Menu (page 13).

Notes

- The "PICTURE NAVIGATION" is not available when playing Super VCDs.
- Depending on the disc, you may not be able to select all functions.
- The sound is muted when using this function.

Scanning the title, chapter, or track (TITLE VIEWER, CHAPTER VIEWER, TRACK VIEWER)

You can divide the screen into 9 subscreens and display the first scene of titles, chapters, or tracks.

You can also play back from the selected title, chapter, or track. After performing step 3 of "Searching by Scene (PICTURE NAVIGATION)" above, select the scene using $\leftarrow/\uparrow/\downarrow/\rightarrow$ and press ENTER.

Hint

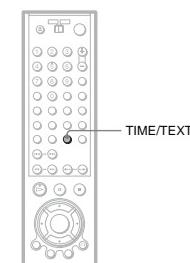
If there are more than 9 titles, chapters, or tracks, \downarrow is displayed at the bottom right. To display the additional titles, chapters, or tracks, select the bottom right scene (the position 9) and press \downarrow . To return to the previous scene, select the top left scene (the position 1) and press \uparrow .

1	2	3	
4	5	6	
7	8	9	\downarrow

Viewing Information About the Disc

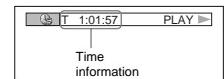
Checking the Playing Time and Remaining Time **DVD-V DVD-RW VCD SA-CD CD DATA CD**

You can check the playing time and remaining time of the current title, chapter, or track. Also, you can check the DVD/Super Audio CD/CD text or track name (MP3 audio) recorded on the disc.



1 Press TIME/TEXT during playback.

The following display appears.



2 Press TIME/TEXT repeatedly to change the time information.

The display and the kinds of time that you can change depend on the disc you are playing.

◆ When playing a DVD VIDEO or DVD-RW

- T *.*.* (hours : minutes : seconds) Playing time of the current title

- T- *.*.* Remaining time of the current title

- C *.*.* Playing time of the current chapter

- C- *.*.* Remaining time of the current chapter

◆ When playing a VIDEO CD (with PBC functions)

- *.*.* (minutes : seconds) Playing time of the current scene

◆ When playing a VIDEO CD (without PBC functions), Super Audio CD, or CD

- T *.*.* (minutes : seconds) Playing time of the current track

- T- *.*.* Remaining time of the current track

- D *.*.* Playing time of the current disc

- D- *.*.* Remaining time of the current disc

◆ When playing a DATA CD (MP3 audio)

- *.*.* (minutes : seconds) Playing time of the current track

◆ When playing a Super VCD

- T *.*.* (minutes : seconds) Playing time of the current track

To check the DVD/Super Audio CD/CD text or track and album names (MP3 audio)

Press TIME/TEXT repeatedly in step 2 to display text recorded on the DVD VIDEO/Super Audio CD/CD/DATA CD. The DVD/Super Audio CD/CD text appears only when text is recorded in the disc. You cannot change the text. If the disc does not contain text, "NO TEXT" appears.



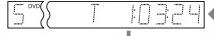
For DATA CDs, the track and album names of the MP3 audio track appear (page 52).

Checking the information on the front panel display

You can view the time information and text displayed on the TV screen also on the front panel display. The information on the front panel display changes as follows when you change the time information on your TV screen.

When playing a DVD VIDEO or DVD-RW

Playing time of the current title



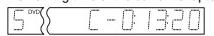
Remaining time of the current title



Playing time of current chapter



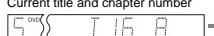
Remaining time of the current chapter



Text



Current title and chapter number



(returns to top automatically)

When playing a DATA CD (MP3 audio)

Track playing time and number of current disc track



Track name

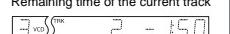


When playing a VIDEO CD (without PBC functions), Super Audio CD, or CD

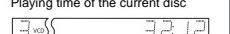
Track playing time and current disc track number



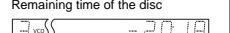
Remaining time of the current track



Playing time of the current disc



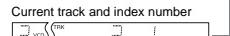
Remaining time of the disc



Text



Current track and index number



(returns to top automatically)

Hints

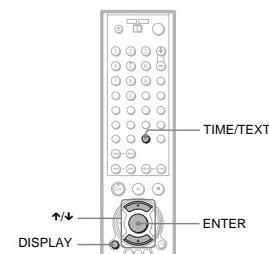
- When playing VIDEO CDs with PBC functions, the disc number, scene number and the playing time are displayed.
- Long text that does not fit in a single line will scroll across the front panel display.
- You can also check the time information and text using the Control Menu (page 13).

Notes

- Depending on the type of disc being played, the disc's text or track name may not be displayed.
- The player can only display the first level of the disc's text, such as the disc name or title.
- Playing time of MP3 audio tracks may not be displayed correctly.

Checking the Play Information

You can check information such as the bit rate or the disc layer that is being played.



To turn off the Control Menu

Press DISPLAY repeatedly until the Control Menu is turned off.

Display of each item

By pressing DISPLAY repeatedly, you can display either "BIT RATE" or "LAYER," whichever was selected in "ADVANCED."

◆ BIT RATE



Bit rate refers to the amount of video/audio data per second in a disc. While playing a disc, an approximate bit rate of the playback picture is displayed as Mbps (Mega bit per second) and the audio as kbps (kilo bit per second). The higher the bit rate, the larger the amount of data. However, this does not always mean that you can get higher quality pictures or sounds.

◆ LAYER

Appears when the DVD has dual layers



Indicates the approximate point where the disc is playing. If it is a dual-layer DVD, the player indicates which layer is being read ("Layer 0" or "Layer 1"). For details on the layers, see page 83 (DVD VIDEO).

Viewing information About the Disc

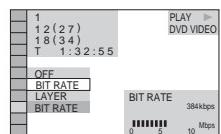
Checking the play information of a DVD (ADVANCED) DVD-V DVD-RW

1 Press DISPLAY during playback.

The Control Menu is displayed.

2 Press \uparrow/\downarrow to select [ADVANCED], then press ENTER.

The options for "ADVANCED" appear.



3 Press \uparrow/\downarrow to select items.

For each item, see "Displays of each item" below.

- BIT RATE: displays the bit rate.
- LAYER: displays the layer and the pick-up point.

4 Press ENTER.

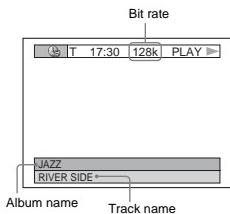
To close the ADVANCED window

Select "OFF" in step 3.

→ continued 51

Checking the play information of a DATA CD DATA CD

By pressing TIME/TEXT while playing MP3 audio tracks on a DATA CD, you can display the audio bit rate (the amount of data per second of the current audio).



Sound Adjustments

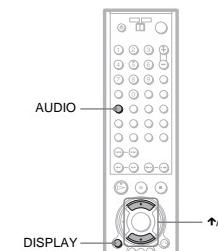
Changing the Sound

DVD-V DVD-RW VCD CD

DATA CD

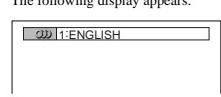
When playing a DVD recorded in multiple audio formats (PCM, Dolby Digital, or DTS), you can change the audio format. If the DVD is recorded with multilingual tracks, you can also change the language.

With CDs, DATA CDs, or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers. For example, when playing a disc containing a song with the vocals on the right channel and the instruments on the left channel, you can hear the instruments from both speakers by selecting the left channel.



1 Press AUDIO during playback.

The following display appears.



2 Press AUDIO repeatedly to select the desired audio signal.

◆ When playing a DVD VIDEO

Depending on the DVD VIDEO, the choice of language varies. When 4 digits are displayed, they indicate a language code. Refer to "Language Code List" on page 86 to see which language the code represents. When the same language is displayed two or more times, the DVD VIDEO is recorded in multiple audio formats.

◆ When playing a DVD-RW

The types of sound tracks recorded on a disc are displayed. The default setting is underlined.

Example:

- 1: MAIN (main sound)
- 1: SUB (sub sound)
- 1: MAIN/SUB (main and sub sound)

◆ When playing a VIDEO CD, CD, or DATA CD (MP3 audio)

The default setting is underlined.

- STEREO: The standard stereo sound
- 1/L: The sound of the left channel (monaural)
- 2/R: The sound of the right channel (monaural)

◆ When playing a Super VCD

The default setting is underlined.

- 1:STEREO: The stereo sound of the audio track 1
- 1:1/L: The sound of the left channel of the audio track 1 (monaural)
- 1:2/R: The sound of the right channel of the audio track 1 (monaural)
- 2:STEREO: The stereo sound of the audio track 2
- 2:1/L: The sound of the left channel of the audio track 2 (monaural)
- 2:2/R: The sound of the right channel of the audio track 2 (monaural)

◆ Hint

You can also select "AUDIO" from the Control Menu (page 13).

Sound Adjustments

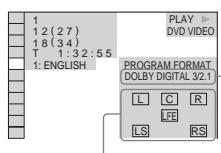
Notes

- While playing a Super VCD on which the audio track 2 is not recorded, no sound will come out when you select "2:STEREO," "2:L/R," or "2:2.R."
- You cannot change the sound for Super Audio CDs.

Displaying the audio information of the disc DVD-V

Press DISPLAY during playback to display the Control Menu. Select "AUDIO" using **↑/↓**. The channels being played are displayed on the screen.

For example, in Dolby Digital format, multiple signals ranging from monaural to 5.1 channel signals can be recorded on a DVD VIDEO. Depending on the DVD VIDEO, the number of the recorded channels may differ.

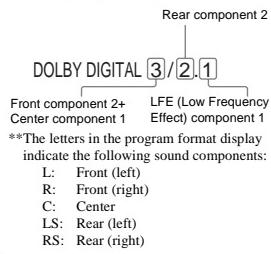
Current audio format*

Currently playing program format**

**"PCM," "DTS," or "DOLBY DIGITAL" is displayed.

In the case of "DOLBY DIGITAL," the channels in the playing track are displayed by numbers as follows:

For Dolby Digital 5.1 ch:



S: Rear (monaural): The rear component of the Dolby Surround processed signal and the Dolby Digital signal
LFE: Low Frequency Effect signal

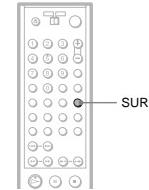
Hint

When playing Dolby Digital or DTS sound tracks, "LFE" is encoded in a dotted line when the LFE signal is not being output.

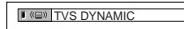
SURROUND Mode

Settings **DVD-V** **DVD-RW** **VCD**
CD **DATA CD**

You can enjoy surround sounds while playing discs including Dolby Digital and DTS DVDs, even if you have only 2 or 4 speakers. Select the surround mode that best suits your speaker setup.

**1 Press SUR during playback.**

The following display appears.

**2 Press SUR repeatedly to select one of the surround modes.**

Refer to the following explanations given for each item.

◆ For 2 speaker setups

- TVS DYNAMIC
- TVS WIDE
- TVS NIGHT
- TVS STANDARD

◆ For 4 to 6 speaker setups

(If you select "NONE" in the setting of "REAR" in "SPEAKER SETUP" (page 77), you cannot select these modes.)

- NORMAL SURROUND
- ENHANCED SURROUND
- VIRTUAL REAR SHIFT
- VIRTUAL MULTI REAR
- VIRTUAL MULTI DIMENSION

To cancel the setting

Select "OFF" in step 2.

For 2 speaker setups

When you connect a stereo TV or 2 front speakers, TVS (TV Virtual Surround) lets you enjoy surround sound effects by using sound imaging to create virtual rear speakers from the sound of the front speakers (L: left, R: right) without using actual rear speakers. TVS was developed by Sony to produce surround sound for home use using just a stereo TV.

If the player is set up to output the signal from the DIGITAL OUT (OPTICAL or COAXIAL) jack, the surround effect will be heard only when "DOLBY DIGITAL" and "DTS" are set to "D-PCM" in "AUDIO SETUP" (page 76).

◆ TVs DYNAMIC

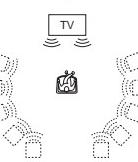
Creates one set of virtual rear speakers from the sound of the actual front speakers (L, R) as shown below.

This mode is effective when the distance between the front L and R speakers is short, such as with built-in speakers on a stereo TV.

**◆ TVs WIDE**

Creates five sets of virtual rear speakers from the sound of the actual front speakers (L, R) as shown below.

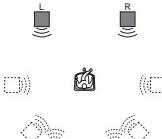
This mode is effective when the distance between the front L and R speakers is short, such as with built-in speakers on a stereo TV.

**◆ TVs NIGHT**

Large sounds, such as explosions, are suppressed, but the quieter sounds are unaffected. This feature is useful when you want to hear the dialog and enjoy the surround sound effects of "TVS WIDE" at low volume.

◆ TVs STANDARD

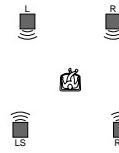
Creates three sets of virtual rear speakers from the sound of the actual front speakers (L, R) as shown below. This mode is effective when you use 2 separate front speakers.



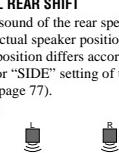
L: Front speaker (left)
R: Front speaker (right)
□: Virtual speaker

◆ NORMAL SURROUND

Software with 2 channel audio signals is decoded with the Dolby Surround (Pro Logic) decoder to create surround effects. The rear speakers will emit identical monaural sounds. If you are using a center speaker, the appropriate sounds for the center speaker will be delivered.

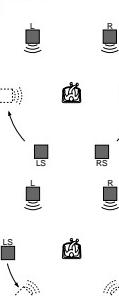
**◆ ENHANCED SURROUND**

Provides a greater sense of presence from a Dolby Surround (Pro Logic) source with a monaural rear channel signal. Produces a stereo like effect in the rear channels.



◆ VIRTUAL REAR SHIFT

Shifts the sound of the rear speakers away from the actual speaker position. The shift position differs according to "REAR" or "SIDE" setting of the rear speakers (page 77).

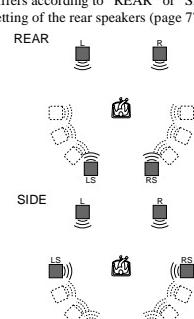
**For 4 to 6 speaker setups**

You can enjoy the following surround effects by using the 2 front speakers and 2 rear speakers.

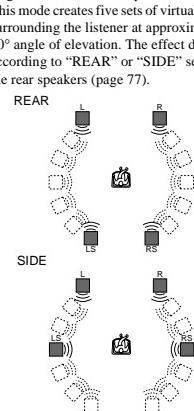
Connect the player to the amplifier (receiver) with the **D-1** connection (page 24). You can experience Dolby Surround (Pro Logic) sounds or Digital Cinema Sound (DCS). DCS uses sound imaging to shift the sound of the rear speakers away from the actual speaker position or create entire sets of virtual rear speakers. "VIRTUAL REAR SHIFT," "VIRTUAL MULTI REAR," and "VIRTUAL MULTI DIMENSION" make use of this technology.

◆ VIRTUAL MULTI REAR

Creates an array of virtual rear speakers from a single set of actual rear speakers. The position of the virtual rear speakers differs according to "REAR" or "SIDE" setting of the rear speakers (page 77).

**◆ VIRTUAL MULTI DIMENSION**

Creates an array of virtual rear speaker positions higher than the listener from a single set of actual rear speakers.



L: Front speaker (left)
R: Front speaker (right)
LS: Rear speaker (left)
RS: Rear speaker (right)
□: Virtual speaker

◆ Hints

- You can select "SURROUND" by pressing the SURROUND button on the player.
- You can also select "SURROUND" from the Control Menu (page 13).

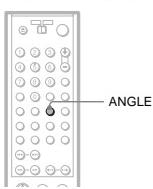
Notes

- To enjoy the multichannel audio through the 5.1CH OUTPUT jacks, correctly set each speaker position and distance (page 77).
- When the playing signal does not contain a signal for the rear speakers, it may be difficult to hear the surround effect.
- When you select one of the TVS modes, the player does not output the sound of center speaker.
- When you select one of the surround modes, turn off the surround setting of the connected TV or amplifier (receiver).
- Make sure that your listening position is between and at an equal distance from your speakers, and that the speakers are located in similar surroundings.
- Not all discs will respond to the "TVS NIGHT" function in the same way.
- If you use the DIGITAL OUT (OPTICAL or COAXIAL) jack and set "DOLBY DIGITAL" to "DOLBY DIGITAL" and "DTS" to "DTS" in "AUDIO SETUP", sound will come from your speakers but it will not have the SURROUND effect.
- If the player is set up to output the signal from the DIGITAL OUT (OPTICAL or COAXIAL) jack, the TVS effect will not be heard when you play a CD.

Changing the Angles

DVD-V

If various angles (multi-angles) for a scene are recorded on the DVD VIDEO, "ANGLE" appears in the front panel display. This means that you can change the viewing angle.

**1 Press ANGLE during playback.**

The number of the angle appears on the display.

**2 Press ANGLE repeatedly to select the angle number.**

The scene changes to the selected angle.

Hint

You can also select "ANGLE" from the Control Menu (page 13).

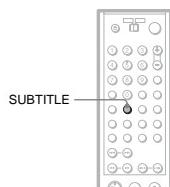
Note

Depending on the DVD VIDEO, you may not be able to change the angles even if multi-angles are recorded on the DVD VIDEO.

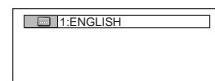
Displaying the Subtitles

DVD-V DVD-RW

If subtitles are recorded on the discs, you can change the subtitles or turn them on and off whenever you want while playing a DVD.

**1 Press SUBTITLE during playback.**

The following display appears.

**2 Press SUBTITLE repeatedly to select the setting.****◆ When playing a DVD VIDEO**

Select the language. Depending on the DVD VIDEO, the choice of language varies. When 4 digits are displayed, they indicate a language code. Refer to "Language Code List" on page 86 to see which language the code represents.

◆ When playing a DVD-RW

Select "ON."

To turn off the subtitles

Select "OFF" in step 2.

Hint

You can also select "SUBTITLE" from the Control Menu (page 13).

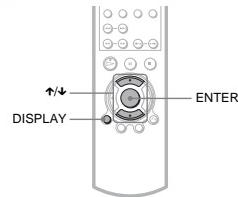
Note

Depending on the DVD VIDEO, you may not be able to change the subtitles even if multilingual subtitles are recorded on it. You also may not be able to turn them off.

Adjusting the Picture Quality (BNR) DVD-V DVD-RW

VCD

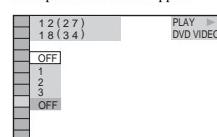
The Block Noise Reduction (BNR) function adjusts the picture quality by reducing the "block noise" or mosaic like patterns that appear on your TV screen.

**1 Press DISPLAY twice during playback.**

The Control Menu appears.

2 Press ↑/↓ to select [BNR] (BNR), then press ENTER.

The options for "BNR" appear.

**3 Press ↑/↓ to select a level.**

- 1: reduces the "block noise."
- 2: reduces the "block noise" more than 1.
- 3: reduces the "block noise" more than 2.

4 Press ENTER.

The disc plays with the setting you selected.

To cancel the "BNR" setting

Select "OFF" in step 3.

To turn off the Control Menu

Press DISPLAY repeatedly until the Control Menu is turned off.

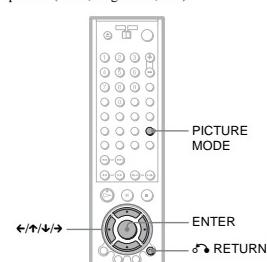
Notes

- If the outlines of the images on your screen should become blurred, set "BNR" to "OFF."
- Depending on the disc or the scene being played, there may be no "BNR" effect, or it may be hard to discern.

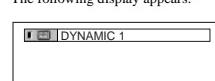
Adjusting the Playback Picture (CUSTOM PICTURE MODE)

DVD-V DVD-RW VCD

You can adjust the video signal of the DVD or VIDEO CD from the player to obtain the picture quality you want. Choose the setting that best suits the program you are watching. When you select "MEMORY," you can make further adjustments to each element of the picture (color, brightness, etc.).

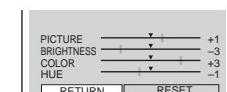
**1 Press PICTURE MODE during playback.**

The following display appears.

**2 Press PICTURE MODE repeatedly to select the setting you want.**

- STANDARD: displays a standard picture.
- DYNAMIC 1: produces a bold dynamic picture by increasing the picture contrast and the color intensity.
- DYNAMIC 2: produces a more dynamic picture than DYNAMIC 1 by further increasing the picture contrast and the color intensity.

- CINEMA 1: enhances details in dark areas by increasing the black level.
- CINEMA 2: White colors become brighter and black colors become richer, and the color contrast is increased.
- MEMORY: adjusts the picture in greater detail.

**Hints**

- When you watch a movie, "CINEMA 1" or "CINEMA 2" is recommended.
- The picture can be adjusted by pressing the PICTURE MODE button on the player as well.
- You can also select "CUSTOM PICTURE MODE" from the Control Menu (page 13).

Adjusting the picture items in "MEMORY"

You can adjust each element of the picture individually.

- PICTURE: changes the contrast
- BRIGHTNESS: changes the overall brightness

- COLOR: makes the colors deeper or lighter

- HUE: changes the color balance

1 Press PICTURE MODE repeatedly to select "MEMORY" and press ENTER.

The "PICTURE" adjustment bar appears.

**2 Press ←/→ to adjust the picture contrast, then press ENTER.**

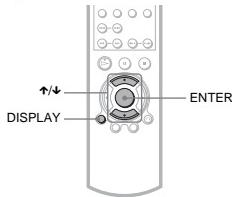
The adjustment is saved, and "BRIGHTNESS" adjustment bar appears.

3 Repeat step 2 to adjust "BRIGHTNESS," "COLOR," and "HUE."

The Custom Picture Mode display appears. You can check each adjustment.

Enhancing the Playback Picture (DIGITAL VIDEO ENHANCER) DVD-V DVD-RW VCD

The Digital Video Enhancer (DVE) function makes the picture appear clear and crisp by enhancing the outlines of images on your TV screen. Also, this function can soften the images on the screen.

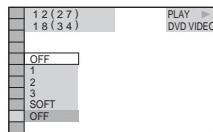


1 Press DISPLAY twice during playback.

The Control Menu appears.

2 Press \uparrow/\downarrow to select (DIGITAL VIDEO ENHANCER), then press ENTER.

The options for "DIGITAL VIDEO ENHANCER" appear.



3 Press \uparrow/\downarrow to select a level.

- 1: enhances the outline.
- 2: enhances the outline more than 1.
- 3: enhances the outline more than 2.
- SOFT: softens the image (DVD only).

4 Press ENTER.

The disc plays with the setting you selected.

To cancel the "DIGITAL VIDEO ENHANCER" setting

Select "OFF" in step 3.

To turn off the Control Menu

Press DISPLAY repeatedly until the Control Menu is turned off.

Note

Depending on the disc or the scene being played, noise found in the disc may become more apparent. If this happens, it is recommended that you use the BNR function (page 59) with the DVE function. If the condition still does not improve, reduce the Digital Video Enhancer level, or select "SOFT" (DVD only) in step 3 above.

Using Various Additional Functions

Locking Discs (CUSTOM PARENTAL CONTROL, PARENTAL CONTROL)

You can set two kinds of playback restrictions for the desired disc.

• Custom Parental Control

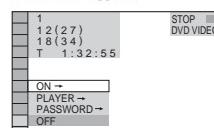
You can set playback restrictions so that the player will not play inappropriate discs.

• Parental Control

Playback of some DVD VIDEOS can be limited according to a predetermined level such as the age of the users. Scenes may be blocked or replaced with different scenes. The same password is used for both Parental Control and Custom Parental Control.

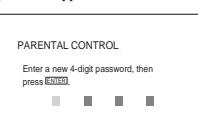
3 Press \uparrow/\downarrow to select (PARENTAL CONTROL), then press ENTER.

The options for "PARENTAL CONTROL" appear.



4 Press \uparrow/\downarrow to select "ON →," then press ENTER.

- ◆ If you have not entered a password
- The display for registering a new password appears.



Enter a 4-digit password using the number buttons, then press ENTER. The display for confirming the password appears.

- ◆ When you have already registered a password

The display for entering the password appears.



5 Enter or re-enter your 4-digit password using the number buttons, then press ENTER.

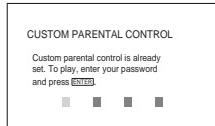
"Custom parental control is set." appears and the screen returns to the Control Menu.

To turn off the Custom Parental Control function

- 1 Follow steps 1 through 3 of "Custom Parental Control."
- 2 Press \uparrow/\downarrow to select "OFF →," then press ENTER.
- 3 Enter your 4-digit password using the number buttons, then press ENTER.

To play a disc for which Custom Parental Control is set

- 1 Insert the disc for which Custom Parental Control is set.
- The "CUSTOM PARENTAL CONTROL" display appears.



- 2 Enter your 4-digit password using the number buttons, then press ENTER. The player is ready for playback.

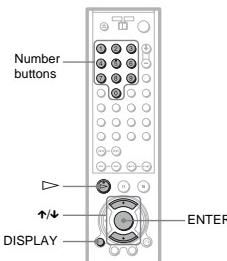
Hint
If you forget your password, enter the 6-digit number "199703" using the number buttons when the "CUSTOM PARENTAL CONTROL" display asks you for your password, then press ENTER. The display will ask you to enter a new 4-digit password.

Note

Once you set Custom Parental Control with a recorded disc such as a DVD-RW, the display for entering the password may appear again when you insert a different recorded disc. Input the password to play the disc.

Parental Control (limited playback) DVD-V

Playback of some DVD VIDEOS can be limited according to a predetermined level such as the age of the users. The "PARENTAL CONTROL" function allows you to set a playback limitation level.

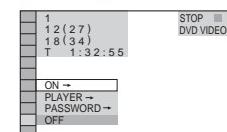


1 Press DISPLAY while the player is in stop mode.

The Control Menu appears.

2 Press \uparrow/\downarrow to select (PARENTAL CONTROL), then press ENTER.

The options for "PARENTAL CONTROL" appear.



3 Press \uparrow/\downarrow to select "PLAYER →," then press ENTER.

- ◆ If you have not entered a password
- The display for registering a new password appears.



Enter a 4-digit password using the number buttons, then press ENTER. The display for confirming the password appears.

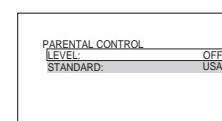
When you have already registered a password

The display for entering the password appears.



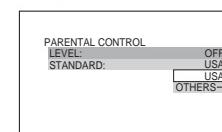
4 Enter or re-enter your 4-digit password using the number buttons, then press ENTER.

The display for setting the playback limitation level appears.



5 Press \uparrow/\downarrow to select "STANDARD," then press ENTER.

The selection items for "STANDARD" are displayed.

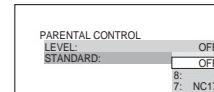


6 Press \uparrow/\downarrow to select a geographic area as the playback limitation level, then press ENTER.

The area is selected. When you select "OTHERS →," select and enter a standard code in the table on page 66 using the number buttons.

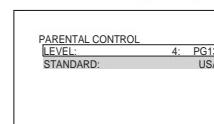
7 Press \uparrow/\downarrow to select "LEVEL," then press ENTER.

The selection items for "LEVEL" are displayed.



8 Select the level you want using \uparrow/\downarrow , then press ENTER.

Parental Control setting is complete.



The lower the value, the stricter the limitation.

To turn off the Parental Control function

Set "LEVEL" to "OFF" in step 8.

To play a disc for which Parental Control is set

- 1 Insert the disc and press ▶.

The display for entering your password appears.

- 2 Enter your 4-digit password using the number buttons, then press ENTER.

The player starts playback.

Hint
If you forget your password, remove the disc and repeat steps 1 to 3 of "Parental Control (limited playback)." When you are asked to enter your password, enter "199703" using the number buttons, then press ENTER. The display will ask you to enter a new 4-digit password. After you enter a new 4-digit password, replace the disc in the player and press ▶. When the display for entering your password appears, enter your new password.

Notes

- When you play discs which do not have the Parental Control function, playback cannot be limited on this player.

- Depending on the disc, you may be asked to change the parental control level while playing the disc. In this case, enter your password, then change the level. If the Resume Play mode is canceled, the level returns to the previous level.

Area Code

Standard	Code number	Standard	Code number
Argentina	2044	Malaysia	2363
Australia	2047	Mexico	2362
Austria	2046	Netherlands	2376
Belgium	2057	New Zealand	2390
Brazil	2070	Norway	2379
Canada	2079	Pakistan	2427
Chile	2090	Philippines	2424
China	2092	Portugal	2436
Denmark	2115	Russia	2489
Finland	2165	Singapore	2501
France	2174	Spain	2149
Germany	2109	Sweden	2499
India	2248	Switzerland	2086
Indonesia	2238	Thailand	2528
Italy	2254	United Kingdom	2184
Japan	2276		
Korea	2304		

Changing the password

- Press **DISPLAY** while the player is in stop mode.
The Control Menu appears.
- Press **↑/↓** to select **(PARENTAL CONTROL)**, then press **ENTER**.
The options for "PARENTAL CONTROL" appear.
- Press **↑/↓** to select "PASSWORD →", then press **ENTER**.
The display for entering the password appears.
- Enter your 4-digit password using the number buttons, then press **ENTER**.
- Enter a new 4-digit password using the number buttons, then press **ENTER**.
- To confirm your password, re-enter it using the number buttons, then press **ENTER**.

If you make a mistake entering your password

Press **←** before you press **ENTER** and input the correct number.

If you make a mistake

Press **RETURN**.

To turn off the display

Press **DISPLAY** repeatedly until the display is turned off.

To turn off the Sound Feedback function

When there is no disc in the player, press and hold **II** on the player for more than two seconds. You will hear two beeps and the Sound Feedback function is turned off.

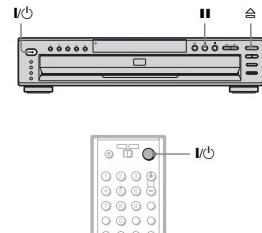
Operation Sound Effects

(Sound Feedback)

The player beeps when the following operations are performed.
The default setting of the Sound Feedback function is set to off.

Operation	Operation sound
Power is turned on	One beep
Power is turned off	Two beeps
▷ is pressed	One beep
II is pressed	Two beeps
Playback is stopped	One long beep
Operation is not possible	Three beeps

Setting Sound Feedback



1 Press **I/O** on the player or the remote.

The player turns on.
When there is a disc in the player, press **△** and remove the disc. Then press **△** again to close the disc tray.

2 Press and hold **II** on the player for more than two seconds.

You will hear one beep and the Sound Feedback function is turned on.

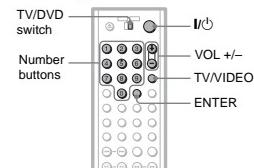
Controlling Your TV or AV Amplifier (Receiver) With the Supplied Remote

By adjusting the remote signal, you can control your TV with the supplied remote. If you connect the player to an AV amplifier (receiver), you can control the volume with the supplied remote.

Notes

- Depending on the connected unit, you may not be able to correctly control your TV or AV amplifier (receiver) using some of the buttons below.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number you have set may be reset to the default setting. Set the appropriate code number again.

Controlling TVs with the remote



- Slide the **TV/DVD** switch to **TV**.
- Hold down **I/O**, and enter your TV's manufacturer code (see "Code numbers of controllable TV's" below) using the number buttons.
- Release **I/O**.

When the **TV/DVD** switch is set to **TV**, the remote performs the following:

I/O	Turns the TV on or off
VOL +/-	Adjusts the volume of the TV
TV/VIDEO	Switches the TV's input source between the TV and other input sources The button works even if the TV/DVD switch is set to DVD
Number buttons	Selects the channel of the TV and ENTER

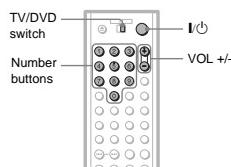
Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony	01 (default)
Akai	04
AOC	04
Centurion	12
Coronado	03
Curtis-Mathes	12
Daytron	12
Emerson	03, 04, 14
Fisher	11
General Electric	06, 10
Gold Star	03, 04, 17
Hitachi	02, 03
J.C.Penney	04, 12
JVC	09
KMC	03
Magnavox	03, 08, 12
Marantz	04, 13
MGA/Mitsubishi	04, 12, 13, 17
NEC	04, 12
Panasonic	06, 19
Philco	03, 04
Philips	08, 21
Pioneer	16

Manufacturer	Code number
Portland	03
Proscan	10
Quasar	06, 18
Radio Shack	05, 14
RCA	04, 10
Sampo	12
Samsung	03, 12, 20
Sanyo	11, 14
Scott	12
Sears	07, 10, 11
Sharp	03, 05, 18
Sylvania	08, 12
Teknika	03, 08, 14
Toshiba	07
Wards	03, 04, 12
Yorx	12
Zenith	15

Controlling the volume of your AV amplifier (receiver) with the remote



- Slide the **TV/DVD** switch to **DVD**.
- Hold down **I/O**, and enter your AV amplifier (receiver)'s manufacturer's code (see the table below) using the number buttons.
- Release **I/O**.
The **VOL +/-** buttons control the AV amplifier's volume.

Code numbers of controllable AV amplifiers (receivers)
If more than one code number is listed, try entering them one at a time until you find the one that works with your AV amplifier (receiver).

Manufacturer	Code number
Sony	80, 88, 89, 91
Denon	84, 85, 86
Kenwood	92, 93
Onkyo	81, 82, 83
Pioneer	99
Sansui	87
Technics	97, 98
Yamaha	94, 95, 96

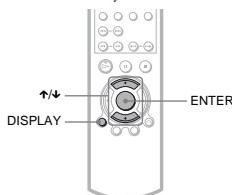
Hint
If you want to control the TV's volume even when the **TV/DVD** switch is set to **DVD**, repeat steps 1 and 2 and enter the code number 90 (default).

Settings and Adjustments**Using the Setup Display**

By using the Setup Display, you can make various adjustments to items such as picture and sound. You can also set a language for the subtitles and the Setup Display, among other things. For details on each Setup Display item, see pages from 71 to 79.

Note

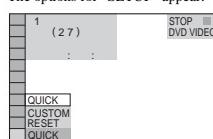
Playback settings stored in the disc take priority over the Setup Display settings and not all the functions described may work.

**1 Press DISPLAY when the player is in stop mode.**

The Control Menu appears.

2 Press ↑/↓ to select [SETUP], then press ENTER.

The options for "SETUP" appear.

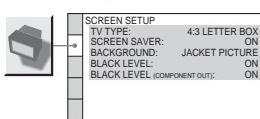
**3 Press ↑/↓ to select "CUSTOM," then press ENTER.**

The Setup Display appears.

**Settings for the Display
(SCREEN SETUP)**

Choose settings according to the TV to be connected.

Select "SCREEN SETUP" in the Setup Display. To use the display, see "Using the Setup Display" (page 70).
The default settings are underlined.

**◆ TV TYPE**

Selects the aspect ratio of the connected TV (4:3 standard or wide).

4:3 LETTER BOX	Select this when you connect a 4:3 screen TV. Displays a wide picture with bands on the upper and lower portions of the screen.
4:3 PAN SCAN	Select this when you connect a 4:3 screen TV. Automatically displays a wide picture on the entire screen and cuts off the portions that do not fit.
16:9	Select this when you connect a wide-screen TV or a TV with a wide mode function.

4:3 LETTER BOX**4:3 PAN SCAN****16:9****Note**

Depending on the DVD, "4:3 LETTER BOX" may be selected automatically instead of "4:3 PAN SCAN" or vice versa.

◆ SCREEN SAVER

The screen saver image appears when you leave the player in pause or stop mode for 15 minutes, or when you play back a Super Audio CD, CD, or DATA CD (MP3 audio) for more than 15 minutes. The screen saver will help prevent your display device from becoming damaged (ghosting). Press **▷** to turn off the screen saver.

◆ BACKGROUND

Selects the background color or picture on the TV screen in stop mode or while playing a Super Audio CD, CD, or DATA CD (MP3 audio).

JACKET PICTURE	The jacket picture (still picture) appears, but only when the jacket picture is already recorded on the disc (CD-EXTRA, etc.). If the disc does not contain a jacket picture, the "GRAPHICS" picture appears.
GRAPHICS	A preset picture stored in the player appears.
BLUE	The background color is blue.
BLACK	The background color is black.

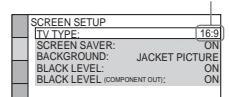
◆ BLACK LEVEL

Selects the black level (setup level) for the video signals output from the jacks other than COMPONENT VIDEO OUT.

ON	Sets the black level of the output signal to the standard level.
OFF	Lowers the standard black level. Use this when the picture becomes too white.

6 Select a setting using ↑/↓, then press ENTER.

The setting is selected and setup is complete.
Example: "16:9"

Selected setting**To turn off the display**

Press DISPLAY repeatedly until the display is turned off.

To enter the Quick Setup mode

Select "QUICK" in step 3. Follow from step 5 of the Quick Setup explanation to make basic adjustments (page 26).

To reset all of the "SETUP" settings

1 Select "RESET" in step 3 and press ENTER.

2 Select "YES" using ↑/↓.

You can also quit the process and return to the Control Menu by selecting "NO" here.

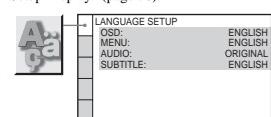
3 Press ENTER.

All the settings explained on pages 71 to 79 return to the default settings. Do not press **I** while resetting the player as it takes a few seconds to complete.

**Setting the Display or Sound Track Language
(LANGUAGE SETUP)**

"LANGUAGE SETUP" allows you to set various languages for the on-screen display or sound track.

Select "LANGUAGE SETUP" in the Setup Display. To use the display, see "Using the Setup Display" (page 70).

**◆ OSD (On-Screen Display)**

Switches the display language on the screen.

◆ MENU (DVD VIDEO only)

You can select the desired language for the disc's menu.

◆ AUDIO (DVD VIDEO only)

Switches the language of the sound track. When you select "ORIGINAL," the language given priority in the disc is selected.

◆ SUBTITLE (DVD VIDEO only)

Switches the language of the subtitle recorded on the DVD VIDEO.

When you select "AUDIO FOLLOW," the language for the subtitles changes according to the language you selected for the sound track.

◆ Hint

If you select "OTHERS →" in "MENU," "SUBTITLE," or "AUDIO" that is not recorded on the DVD VIDEO, one of the recorded languages will be automatically selected.

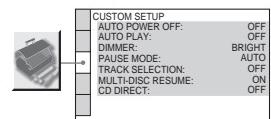
Note

When you select a language in "MENU," "SUBTITLE," or "AUDIO" that is not recorded on the DVD VIDEO, one of the recorded languages will be automatically selected.

Custom Settings (CUSTOM SETUP)

Use this to set up playback related and other settings.

Select "CUSTOM SETUP" in the Setup Display. To use the display, see "Using the Setup Display" (page 70).
The default settings are underlined.

**◆ AUTO POWER OFF**

Switches the Auto Power Off setting on or off.

OFF	Switches this function off.
ON	The player enters standby mode when left in stop mode for more than 30 minutes.

◆ AUTO PLAY

Switches the Auto Play setting on or off. This function is useful when the player is connected to a timer (not supplied).

OFF	Switches this function off.
ON	Automatically starts playback when the player is turned on.

◆ DIMMER

Adjusts the lighting of the front panel display.

BRIGHT	Makes the lighting bright.
DARK	Makes the lighting dark.
AUTO DARK	Makes the lighting dark if you do not operate the player or the remote for a short while.

◆ PAUSE MODE (DVD VIDEO/DVD-RW only)
Selects the picture in pause mode.

AUTO	The picture, including subjects that move dynamically, is output with no jitter. Normally select this position.
FRAME	The picture, including subjects that do not move dynamically, is output in high resolution.

◆ TRACK SELECTION (DVD VIDEO only)
Gives the sound track which contains the highest number of channels priority when you play a DVD VIDEO on which multiple audio formats (PCM, DTS, or Dolby Digital format) are recorded.

OFF	No priority given.
AUTO	Priority given.

Notes

- When you set the item to "AUTO," the language may change. The "TRACK SELECTION" setting has higher priority than the "AUDIO" settings in "LANGUAGE SETUP" (page 71).
- If PCM, DTS, and Dolby Digital sound tracks have the same number of channels, the player selects PCM, DTS, and Dolby Digital sound tracks in this order.

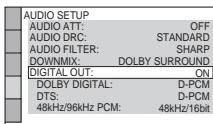
◆ MULTI-DISC RESUME (DVD VIDEO/VIDEO CD only)

Switches the Multi-disc Resume setting on or off. Resume playback point can be stored in memory for up to 6 different DVD VIDEO/VIDEO CD discs (page 33).

ON	Stores the resume settings in memory for up to 6 discs (The settings remain in memory even if you select "OFF.")
OFF	Does not store the resume settings in memory. Playback restarts at the resume point only for the current disc in the player.

To set the digital output signal

The following switch the method of outputting audio signals when you connect a component such as an amplifier (receiver) or MD deck with a digital input jack. For connection details, see page 20. Select "DOLBY DIGITAL," "DTS," and "48 kHz/96 kHz PCM" after setting "DIGITAL OUT" to "ON."



If you connect a component that does not conform to the selected audio signal, a loud noise (or no sound) will come out from the speakers, damaging your ears or speakers.

• DOLBY DIGITAL (DVD only)
Selects the type of Dolby Digital signal.

D-PCM	Select this when the player is connected to an audio component without a built-in Dolby Digital decoder. You can select whether the signals conform to Dolby Surround (Pro Logic) or not by making adjustments to the "DOWNMIX" item in "AUDIO SETUP" (page 75).
DOLBY DIGITAL	Select this when the player is connected to an audio component with a built-in Dolby Digital decoder.

- DTS (DVD VIDEO only)
Selects the type of DTS signal.

D-PCM	Select this when the player is connected to an audio component without a built-in DTS decoder. If you play DTS audio sound tracks, the player outputs stereo signals to the DIGITAL OUT (OPTICAL or COAXIAL) jacks.
DTS	Select this when the player is connected to an audio component with a built-in DTS decoder.

- 48kHz/96kHz PCM (DVD VIDEO only)
Selects the sampling frequency of the audio signal.

48kHz/16bit	The audio signals of DVD VIDEOS are always converted to 48kHz/16bit.
96kHz/24bit	All types of signals including 96kHz/24bit are output in their original format. However, if the signal is encrypted for copyright protection purposes, the signal is only output as 48kHz/16bit.

Notes

- Even if you set "48kHz/96kHz PCM" to "96kHz/24bit," the sampling frequency is converted to 48kHz/16bit when a "SURROUND" mode (page 55) is selected.
- The analog audio signals from the LINE OUT L/R (AUDIO) jacks and 5.1CH OUTPUT jacks are not affected by this setting and keep their original sampling frequency level.

Settings for the Sound
(AUDIO SETUP)

"AUDIO SETUP" allows you to set the sound according to the playback and connection conditions.

Select "AUDIO SETUP" in the Setup Display. To use the display, see "Using the Setup Display" (page 70). The default settings are underlined.

OFF	Select this when playing CD discs, including CDs with DTS tracks.
ON	Eliminates the use of unnecessary circuits needed to play CDs.

Note

If you select "ON" when playing CDs with DTS tracks, the sound will become noisy.

◆ AUDIO FILTER (except Super Audio CD)
Selects the digital filter to reduce noise above 22.05 kHz (Sampling frequency (Fs) of the audio source is 44.1 kHz), 24 kHz (Fs is 48 kHz), or 48 kHz (Fs is above 96 kHz).

SHARP	Provides a wide frequency range and spatial feeling.
SLOW	Provides smooth and warm sound.

Note

There may be little effect by changing the digital filter depending on discs or playback environment.

◆ DOWNMIX (DVD only)

Switches the method for mixing down to 2 channels when you play a DVD which has rear sound elements (channels) or is recorded in Dolby Digital format. For details on the rear signal components, see "Displaying the audio information of the disc" (page 54). This function affects the output of the following jacks:

AUDIO SETUP	OFF
AUDIO ATT:	STANDARD
AUDIO DRC:	SHARP
AUDIO FILTER:	DOWNMIX
DOWNMIX:	DOLBY SURROUND
DIGITAL OUT:	ON
DOLBY DIGITAL:	D-PCM
DTS:	D-PCM
48kHz/96kHz PCM:	48kHz/16bit

◆ AUDIO ATT (attenuation)

If the playback sound is distorted, set this item to "ON." The player reduces the audio output level.

This function affects the output of the following jacks:

- LINE OUT L/R (AUDIO) 1/2 jacks

-DIGITAL OUT (OPTICAL or COAXIAL) jack when "DOLBY DIGITAL" and "DTS" is set to "D-PCM" (page 76).

OFF	Normally, select this position.
ON	Select this when the playback sound from the speakers is distorted.

◆ AUDIO DRC (Dynamic Range Control) (DVD only)

Makes the sound clear when the volume is turned down when playing a DVD that conforms to "AUDIO DRC." This affects the output from the following jacks:

- LINE OUT L/R (AUDIO) 1/2 jacks

-5.1CH OUTPUT jacks

-DIGITAL OUT (OPTICAL or COAXIAL) jack only when "DOLBY DIGITAL" is set to "D-PCM" (page 76).

STANDARD	Normally select this position.
TV MODE	Makes the low sounds clear even if you turn the volume down.
WIDE RANGE	Gives you the feeling of being at a live performance.

◆ DIGITAL OUT

Select this if audio signals are to be output via the DIGITAL OUT (OPTICAL or COAXIAL) jack.

ON	Normally select this position. When you select "ON," see "To set the digital output signal" for further settings.
OFF	The influence of the digital circuit upon the analog circuit is minimal.

Note

Super Audio CD audio signals are not output from a digital jack.

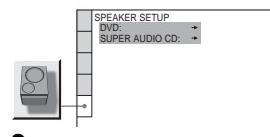
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Settings for the Speakers
(SPEAKER SETUP)

To obtain the best possible surround sound, set the size of the speakers you have connected and their distance from your listening position. Then use the test tone to adjust the volume and the balance of the speakers to the same level. This setting is effective when connecting the speaker with 5.1 CH OUTPUT jacks (page 24).

You can create two different Speaker Setup settings, one for Super Audio CDs and one for all other types of discs.

1 Follow steps 1 through 4 of "Using the setup display" (page 70) to select "SPEAKER SETUP" in the Setup display.



2 Select "DVD" or "SUPER AUDIO CD" using ↑/↓, then press ENTER.

Example: when "DVD" is selected.



3 Set the following items in the order that they are explained below.

The default settings are underlined.

To return to the default setting

Select the item, then press CLEAR. Note that only the "SIZE" setting does not return to the default setting.

◆ SIZE

Selects the size of the speakers.

• FRONT

LARGE	Normally select this position.
SMALL	Select this when the speaker cannot reproduce adequate bass frequencies.

• CENTER

LARGE	Normally select this position.
SMALL	Select this when the speaker cannot reproduce adequate bass frequencies.
NONE	Select this if you do not connect a center speaker.

• REAR

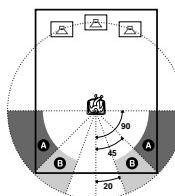
LARGE (REAR/SIDE)	Normally select this position. Select according to the rear speaker position*.
SMALL (REAR/SIDE)	Select this when the sound distorts or the surround effects are difficult to hear. Select according to the rear speaker position*.
NONE	Select this if you do not connect rear speakers.

* Rear speaker position
Correctly specify the location of the rear speakers to enjoy the surround effect.

• Set to "SIDE," if the location of the rear speakers corresponds to section A below.

• Set to "REAR," if the location of the rear speakers corresponds to section B below.

This setting affects only "VIRTUAL REAR SHIFT," "VIRTUAL MULTI REAR," and "VIRTUAL MULTI DIMENSION" mode (page 55).


SUBWOOFER

YES	Select this if you connect a subwoofer to output the LFE (low frequency effect) signals from the subwoofer.
NONE	Select this if you do not connect a subwoofer.

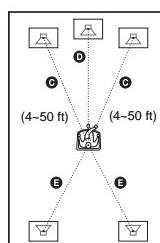
Notes

- The cut off frequency for the subwoofer is fixed at 120 Hz.
- If your speakers are too small to reproduce low bass frequencies, utilize a subwoofer for low frequency sound. When you set all speaker settings to "SMALL," the bass redirection circuitry will be activated and the bass frequencies for the speakers are output from the subwoofer.
- Even if there are fewer than 6 speakers connected, the player distributes the audio signal components to the front speakers.

DISTANCE (DVD only)

Sets the distance from your listening position to the speakers.

Set the distance to your front speakers in "FRONT" first (①). Then adjust the values in "CENTER" (center speaker ②) and "REAR" (rear speakers ③) to reflect the actual distance to your center and rear speakers.



Be sure to change the value in the Setup Display when you move the speakers. The default adjustments are in parentheses.

FRONT (10 ft)	Set this between 4 and 50 feet in 1 foot increments.
CENTER (10 ft)	Set this within -5 and +2 feet of the "FRONT" setting in 1 foot increments. For example, if "FRONT" is set to 6 feet, "CENTER" can be set between 1 and 8 feet.
REAR (10 ft)	Set this between the "FRONT" setting and -16 feet in 1 foot increments. For example, if "FRONT" is set to 17 feet, "REAR" can be set between 1 and 17 feet.

Notes

- If each of the front or rear speakers are not placed at an equal distance from your listening position, set the distance according to the closest speaker.
- Do not place the rear speakers farther away from your listening position than the front speakers.
- These settings do not affect the Super Audio CD audio signals.

◆ LEVEL (FRONT)

Varies the level of the front speakers. Be sure to set "TEST TONE" to "ON" for easy adjustment.

The default adjustments are in parentheses.

L (0 dB)	Set this between -6 dB and 0 dB in 0.5 dB increments.
R (0 dB)	Set this between -6 dB and 0 dB in 0.5 dB increments.
CENTER (0 dB)	Set this between -12 dB and 0 dB in 0.5 dB increments.
SUBWOOFER (DVD: -5 dB / SUPER AUDIO CD: 0 dB)	For DVDs: (When "SIZE" are set to the default settings): Set this between -10 dB and +10 dB in 0.5 dB increments. (When "SIZE" are not set to the default settings): Set this between -15 dB and +5 dB in 0.5 dB increments. For Super Audio CDs: Set this between -10 dB and +10 dB in 0.5 dB increments.

◆ LEVEL (REAR)

Varies the level of the rear speakers. Be sure to set "TEST TONE" to "ON" for easy adjustment.

The default adjustments are in parentheses.

L (0 dB)	Set this between -12 dB and 0 dB in 0.5 dB increments.
R (0 dB)	Set this between -12 dB and 0 dB in 0.5 dB increments.

To adjust the volume of all the speakers at one time

Use the amplifier's (receiver's) volume control.

◆ TEST TONE

The speakers will emit a test tone. Use this when you use the 5.1CH OUTPUT jacks and adjust "LEVEL (FRONT)" and "LEVEL (REAR)."

OFF	The test tone is not emitted from the speakers.
ON	The test tone is emitted from each speaker in sequence while adjusting balance or level.

Additional Information
Troubleshooting

If you experience any of the following difficulties while using the player, use this troubleshooting guide to help remedy the problem before requesting repairs. Should any problem persist, consult your nearest Sony dealer (for customers in the U.S.A. only).

Power
The power is not turned on.

- Check that the AC power cord is connected securely.

Picture
There is no picture/picture noise appears.

- Re-connect the connecting cord securely.
- The connecting cords are damaged.
- Check the connection to your TV (page 17) and switch the input selector on your TV so that the signal from the player appears on the TV screen.

The disc is dirty or flawed.

- If the picture output from your player goes through your VCR to get to your TV or if you are connected to a combination TV/VIDEO player, the copy-protection signal applied to some DVD programs could affect picture quality. If you still experience problems even when you connect your player directly to your TV, please try connecting your player to your TV's S VIDEO input (page 17).

- You have set the player to progressive format (the PROGRESSIVE indicator lights up in blue) even though your TV cannot accept the progressive signal. In this case, press the PROGRESSIVE button on the front panel until the progressive indicator turns off.
- Even if your TV is compatible with progressive format (480p) signals, the image may be affected when you set the player to progressive format. In this case, press the PROGRESSIVE button so that the PROGRESSIVE indicator turns off and the player is set to normal (interlace) format.

Even though you set the aspect ratio in "TV TYPE" or "SCREEN SETUP," the picture does not fill the screen.

- The aspect ratio of the disc is fixed on your DVD.

Sound
There is no sound.

- Re-connect the connecting cord securely.
- The connecting cord is damaged.
- The player is connected to the wrong input jack on the amplifier (receiver) (page 22, 23, 24).
- The amplifier (receiver) input is not correctly set.
- The player is in pause mode or in Slow-motion Play mode.
- The player is in fast forward or fast reverse mode.
- If the audio signal does not come through the DIGITAL OUT (OPTICAL or COAXIAL) jack, check the audio settings (page 75).
- Super Audio CD audio signals are not output from the digital jack.
- While playing a Super VCD on which the audio track 2 is not recorded, no sound will come out when you select "2:STEREO," "2:1/L," or "2:2/R."

Sound distortion occurs.

- Set "AUDIO ATT" in "AUDIO SETUP" to "ON" (page 75).

The sound volume is low.

- The sound volume is low on some DVDs. The sound volume may improve if you set "AUDIO DRC" to "TV MODE" (page 75).
- Set "AUDIO ATT" in "AUDIO SETUP" to "OFF" (page 75).

The surround effect is difficult to hear when you are playing a Dolby Digital or DTS sound track.

- Check the speaker connections and setting (page 24, 26, 76).
- The 5.1 channel sound is not recorded on the disc being played.

The sound comes from the center speaker only.

- Depending on the disc, the sound may come from the center speaker only.
- Set "SURROUND" to "OFF" (page 55).

Operation
The remote does not function.

- There are obstacles between the remote and the player.
- The distance between the remote and the player is too far.
- The remote is not pointed at the remote sensor on the player.
- The batteries in the remote are weak.

The disc does not play.

- The disc is turned over.
- Insert the disc with the playback side facing down on the disc tray.
- The disc is skewed.
- The player cannot play certain discs (page 6).
- The region code on the DVD does not match the player.
- Moisture has condensed inside the player (page 3).
- The player cannot play a recorded disc that is not correctly finalized (page 7).

The MP3 audio track cannot be played (page 38).

- The DATA CD is not recorded in the MP3 format that conforms to ISO9660 Level 1/Level 2 or Joliet.
- The MP3 audio track does not have the extension ".MP3."
- The data is not formatted in MP3 even though it has the extension ".MP3."
- The data is not MPEGI Audio Layer 3 data.
- The player cannot play audio tracks in MP3PRO format.

"Copyright lock" appears and the screen turns blue when playing a DVD-RW disc.

- Images taken from digital broadcasts, etc., may contain copy protection signals, such as complete copy protection signals, single copy signals, and restriction-free signals. When images that contain copy protection signals are played, a blue screen may appear instead of the images. It may take a while when looking for playable images.

Adjusting the speaker volume and level
1 Select "SPEAKER SETUP" in the Setup Display.
2 Select "TEST TONE" and set to "ON."
3 From your listening position, select "LEVEL (FRONT)" or "LEVEL (REAR)" and adjust the value using ↑/↓.
4 Select "TEST TONE" and set to "OFF" to turn off the test tone.
Note

The test tone signals are not output from the digital jack.

The title of the MP3 audio album or track is not correctly displayed.

- The player can only display numbers and alphabet. Other characters are displayed as "...".

The disc does not start playing from the beginning.

- Program Play, Shuffle Play, Repeat Play, or A-B Repeat Play has been selected (page 40).
- Resume play has taken effect (page 33).

The player starts playing the disc automatically.

- The disc features an auto playback function.
- "AUTO PLAY" in "CUSTOM SETUP" is set to "ON" (page 73).

Playback stops automatically.

- While playing discs with an auto pause signal, the player stops playback at the auto pause signal.

You cannot perform some functions such as Stop, Search, Slow-motion Play, Repeat Play, Shuffle Play, or Program Play.

- Depending on the disc, you may not be able to do some of the operations above. See the operating manual that comes with the disc.

The language for the sound track cannot be changed.

- Try using the DVD's menu instead of the direct selection button on the remote (page 34).
- Multilingual tracks are not recorded on the DVD being played.
- The DVD prohibits the changing of the language for the sound track.

The subtitle language cannot be changed or turned off.

- Try using the DVD's menu instead of the direct selection button on the remote (page 34).
- Multilingual subtitles are not recorded on the DVD being played.
- The DVD prohibits the changing of the subtitles.

The angles cannot be changed.

- Try using the DVD's menu instead of the direct selection button on the remote (page 34).
- Multi-angles are not recorded on the DVD being played.
- The angle can only be changed when the "ANGLE" indicator lights up on the front panel display (page 10).
- The DVD prohibits changing of the angles.

The player does not operate properly.

- When static electricity, etc., causes the player to operate abnormally, unplug the player.

5 numbers or letters are displayed on the screen and on the front panel display.

- The self-diagnosis function was activated. (See the table on page 82.)

The disc tray does not open and "LOCKED" appears on the front panel display.

- Child Lock is set (page 32).

The disc tray does not open and "TRAY LOCKED" appears on the front panel display.

- Contact your Sony dealer or local authorized Sony service facility.

"Data error" appears on the TV screen when playing a DATA CD.

- The MP3 audio track you want to play is broken.
- The data is not MPEG1 Audio Layer 3 data.

Self-diagnosis Function**(When letters/numbers appear in the display)**

When the self-diagnosis function is activated to prevent the player from malfunctioning, a five-character service number (e.g., C 13 50) with a combination of a letter and four digits appears on the screen and the front panel display. In this case, check the following table.



First three characters of the service number	Cause and/or corrective action
C 13	The disc is dirty. → Clean the disc with a soft cloth (page 8).
C 31	The disc is not inserted correctly. → Re-insert the disc correctly.
E XX (xx is a number)	To prevent a malfunction, the player has performed the self-diagnosis function. → Contact your nearest Sony dealer or local authorized Sony service facility and give the 5-character service number. Example: E 61 10

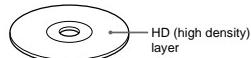
Index (CD)/Video Index (VIDEO CD) (page 13)

A number that divides a track into sections to easily locate the point you want on a CD or VIDEO CD. Depending on the disc, no index may be recorded.

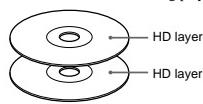
Interlace format (page 19)

Interlace format shows every other line of an image as a single "field" and is the standard method for displaying images on television. The even number field shows the even numbered lines of an image, and the odd numbered field shows the odd numbered lines of an image.

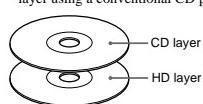
- Super Audio CD (single layer disc)
This disc consists of a single HD layer*. *High density signal layer for the Super Audio CD



- Super Audio CD (dual layer disc)
This disc consists of dual HD layers and is capable of extended play over long periods. Also, as the dual layer disc consists of dual HD layers on one side only, you do not have to turn the disc over during playback.



- Super Audio CD + CD (Hybrid disc)
This disc consists of an HD layer and a CD layer. Also, as the dual layers are on one side only, you do not have to turn the disc over during playback. You can play the CD layer using a conventional CD player.

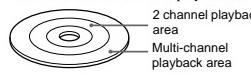
**Scene (page 13)**

On a VIDEO CD with PBC (playback control) functions, the menu screens, moving pictures and still pictures are divided into sections called "scenes."

Super Audio CD (page 6)

A Super Audio CD disc can reproduce sounds that are extremely faithful to the original sound by use of DSD (Direct Stream Digital) technology. This technology utilizes a sampling frequency of 2.8224 MHz, which is 64 times that of a conventional CD, and 1-bit quantization that enables the disc to hold 4 times the amount of information that a standard PCM format CD can hold. Super Audio CDs are divided into the following types.

- 2 channel + Multi-channel Super Audio CD
This disc consists of the 2 channel playback area and the multi-channel playback area.

**Title (page 10)**

The longest section of a picture or music feature on a DVD, movie, etc., in video software, or the entire album in audio software.

- Track (page 10)
Sections of a picture or a music feature on a CD or VIDEO CD (the length of a song).

Glossary**Chapter (page 13)**

Sections of a picture or a music feature that are smaller than titles. A title is composed of several chapters. Depending on the disc, no chapters may be recorded.

Dolby Digital (page 24, 76)

Digital audio compression technology developed by Dolby Laboratories. This technology conforms to multi-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. Dolby Digital provides the same multi discrete channels of high quality digital audio found in "Dolby Digital" theater surround sound systems. Good channel separation is realized because all of the channel data are recorded discretely and little deterioration is realized because all channel data processing is digital.

Dolby Surround (Pro Logic) (page 23)

Audio signal processing technology that Dolby Laboratories developed for surround sound. When the input signal contains a surround component, the Pro Logic process outputs the front, center and rear signals. The rear channel is monaural.

DTS (page 24, 76)

Digital audio compression technology that Digital Theater Systems, Inc. developed. This technology conforms to multi-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. DTS provides the same multi discrete channels of high quality digital audio. Good channel separation is realized because all of the channel data is recorded discretely and little deterioration is realized because all channel data processing is digital.

DVD VIDEO (page 6)

A disc that contains up to 8 hours of moving pictures even though its diameter is the same as a CD.

The data capacity of a single-layer and single-sided DVD is 4.7 GB (Giga Byte), which is 7

times that of a CD. The data capacity of a double-layer and single-sided DVD is 8.5 GB, a single-layer and double-sided DVD is 9.4 GB, and double-layer and double-sided DVD is 17 GB.

The picture data uses the MPEG 2 format, one of the worldwide standards of digital compression technology. The picture data is compressed to about 1/40 (average) of its original size. The DVD also uses a variable rate coding technology that changes the data to be allocated according to the status of the picture. Audio information is recorded in a multi-channel format, such as Dolby Digital, allowing you to enjoy a more real audio presence.

Furthermore, various advanced functions such as the multi-angle, multilingual, and Parental Control functions are provided with the DVD.

DVD-RW (page 6)

A DVD-RW is a recordable and rewritable disc that is the same size as a DVD VIDEO. The DVD-RW has two different modes: VR mode and Video mode. DVD-RWs created in Video mode have the same format as a DVD VIDEO, while discs created in VR (Video Recording) mode allow the contents to be programmed or edited.

DVD+RW (page 6)

A DVD+RW (plus RW) is a recordable and rewritable disc. DVD+RWs use a recording format that is comparable to the DVD VIDEO format.

Additional Information**Language Code List**

For details, see pages 53, 58, 71.

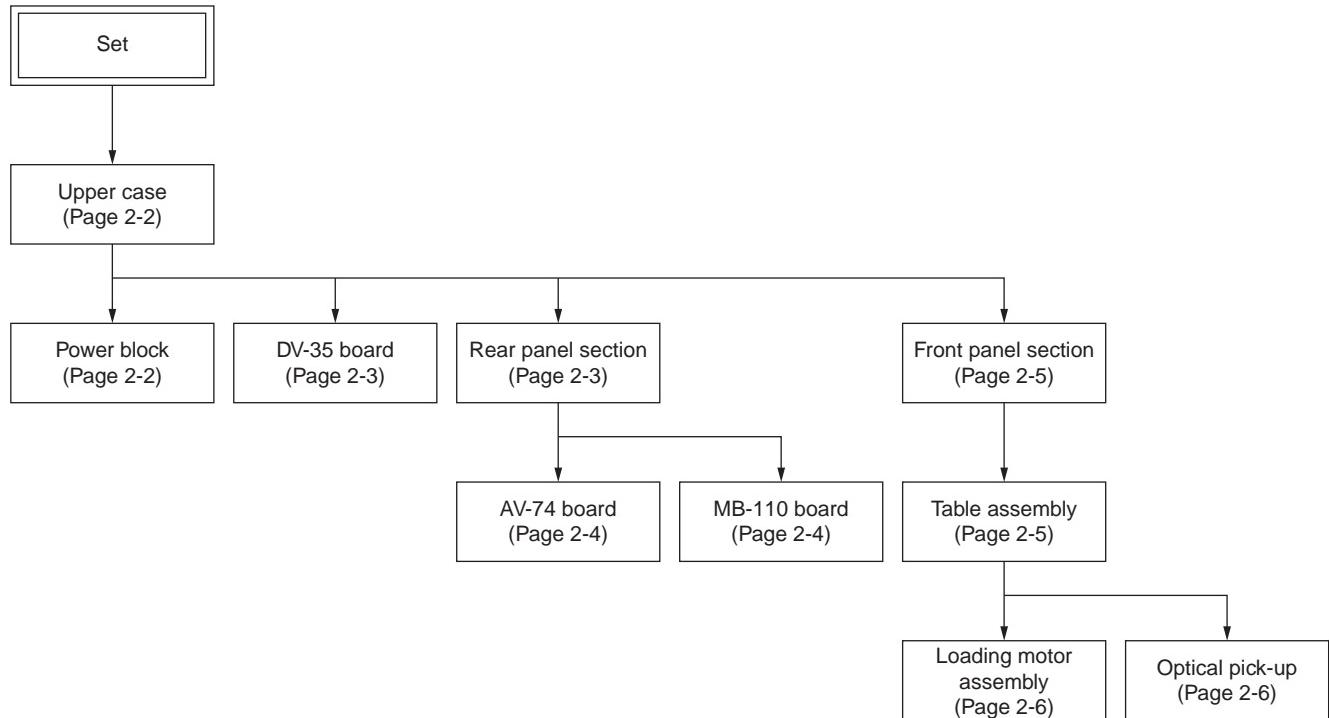
The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code Language	Code Language	Code Language	Code Language
1027 Afar	1183 Irish	1347 Maori	1507 Samoan
1028 Abkhazian	1186 Scots Gaelic	1349 Macedonian	1508 Shona
1032 Afrikaans	1194 Galician	1350 Malayalam	1509 Somali
1039 Amharic	1196 Guarani	1352 Mongolian	1511 Albanian
1044 Arabic	1203 Gujarati	1353 Moldavian	1512 Serbian
1045 Assamese	1209 Hausa	1356 Marathi	1513 Siswati
1051 Aymara	1217 Hindi	1357 Malay	1514 Sesotho
1052 Azerbaijani	1226 Croatian	1358 Maltese	1515 Sundanese
1053 Bashkir	1229 Hungarian	1363 Burmese	1516 Swedish
1057 Byelorussian	1233 Armenian	1365 Nauru	1517 Swahili
1059 Bulgarian	1235 Interlingua	1369 Nepali	1521 Tamil
1060 Bihar	1239 Interlingue	1376 Dutch	1525 Telugu
1061 Bislama	1245 Inupiak	1379 Norwegian	1527 Tajik
1066 Bengali;	1248 Indonesian	1393 Occitan	1528 Thai
	1253 Icelandic	1403 (Afan)Oromo	1529 Tigrinya
1067 Tibetan	1254 Italian	1408 Oriya	1531 Turkmen
1070 Breton	1257 Hebrew	1417 Punjabi	1532 Tagalog
1079 Catalan	1261 Japanese	1428 Polish	1534 Setswana
1093 Corsican	1269 Yiddish	1435 Pashto;	1535 Tonga
1097 Czech	1283 Javanese	1436 Portuguese	1539 Tsonga
1103 Welsh	1287 Georgian	1463 Quechua	1540 Tatar
1105 Danish	1297 Kazakh	1481 Rhaeto-Romanie	1543 Twi
1109 German	1298 Greenlandic	1482 Kirundi	1557 Ukrainian
1130 Bhutani	1299 Cambodian	1483 Romanian	1564 Urdu
1142 Greek	1300 Kannada	1489 Russian	1572 Uzbek
1144 English	1301 Korean	1491 Kinyarwanda	1581 Vietnamese
1145 Esperanto	1305 Kashmiri	1495 Sanskrit	1587 Volapük
1149 Spanish	1307 Kurdish	1498 Sindhi	1613 Wolof
1150 Estonian	1311 Kirghiz	1501 Sangho	1632 Xhosa
1151 Basque	1313 Latin	1502 Serbo-Croatian	1665 Yoruba
1157 Persian	1326 Lingala	1503 Slovenian	1684 Chinese
1165 Finnish	1327 Laotian	1505 Slovak	1697 Zulu
1166 Fiji	1332 Lithuanian	1506 Malagasy	
1171 Faroese	1334 Latvian;		
1174 French	Lettish		
1181 Frisian	1503 Sinhalese		
			1703 Not specified

SECTION 2 DISASSEMBLY

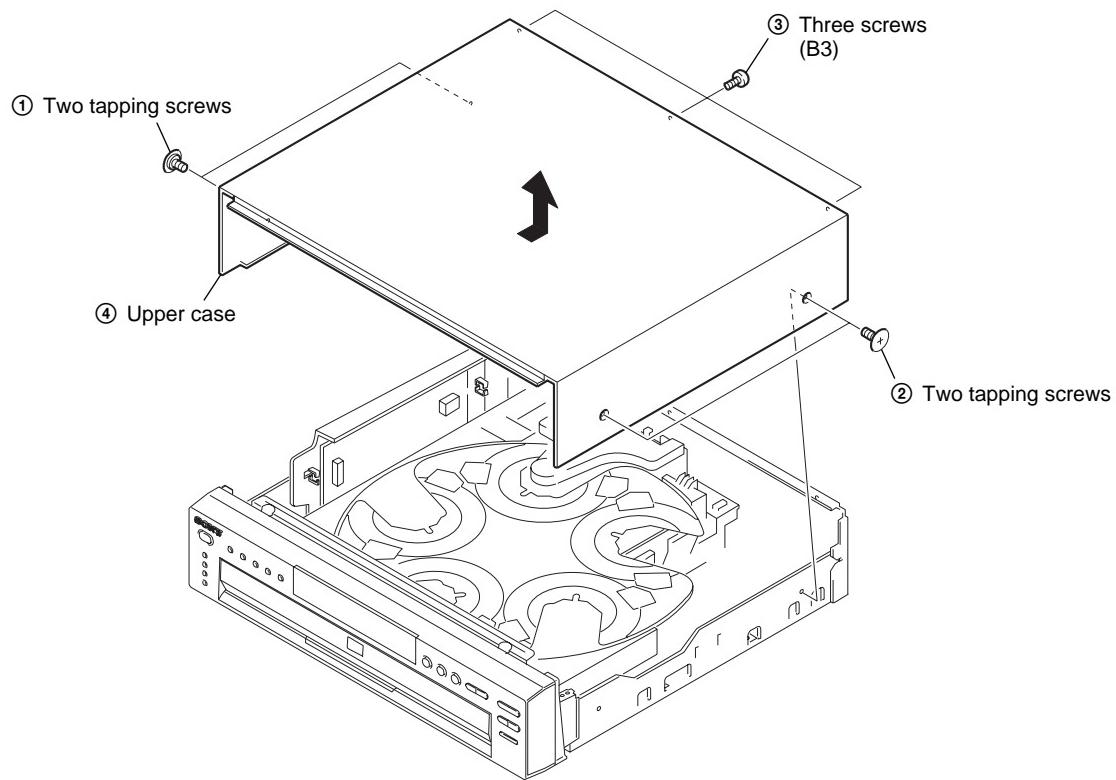
2-1. DISASSEMBLY

- This set can be disassembled in the order shown below.

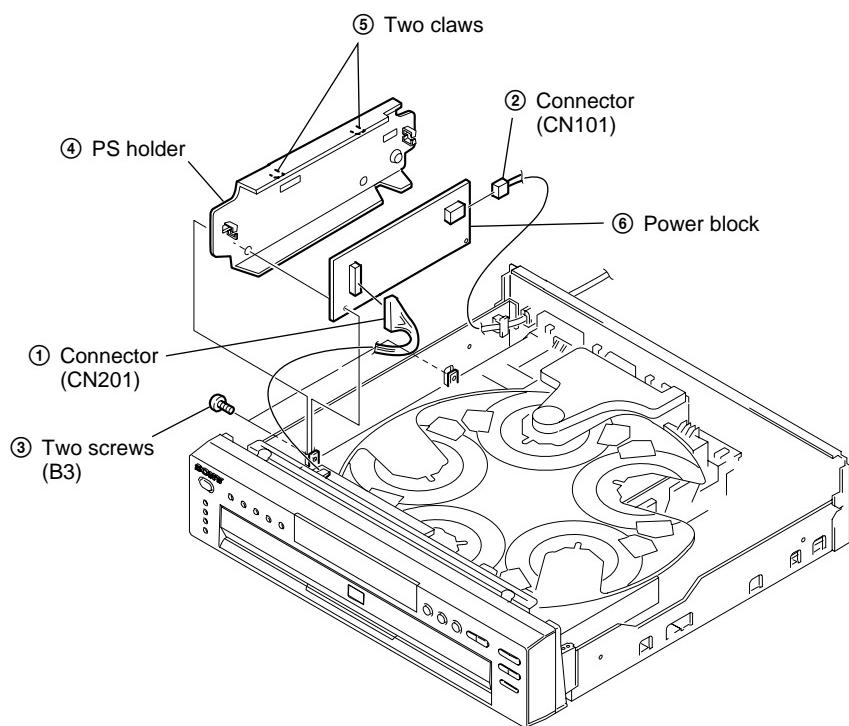


Note: Follow the disassembly procedure in the numerical order given.

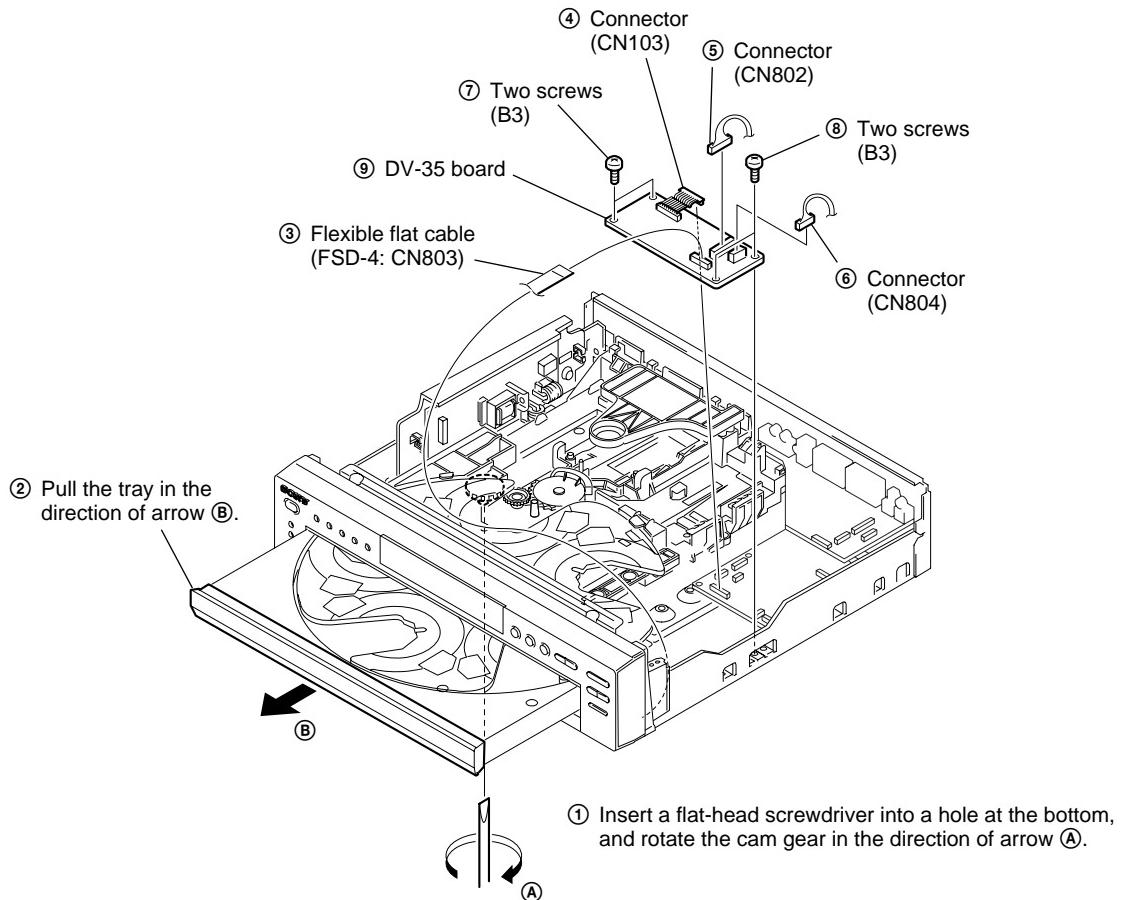
2-2. UPPER CASE



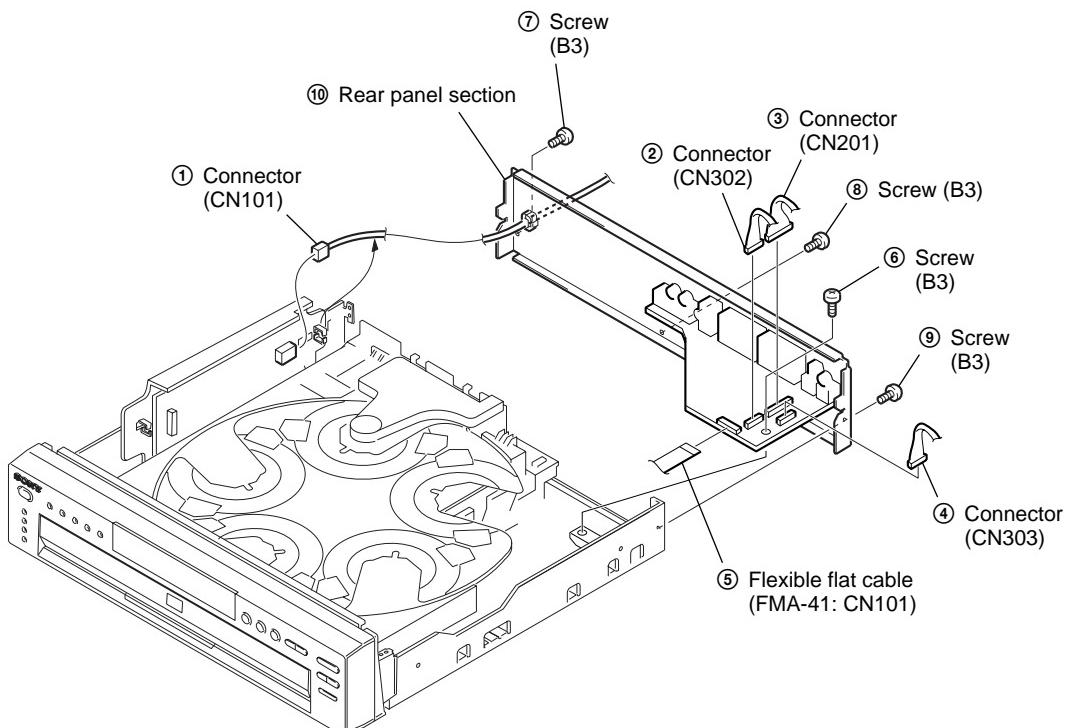
2-3. POWER BLOCK



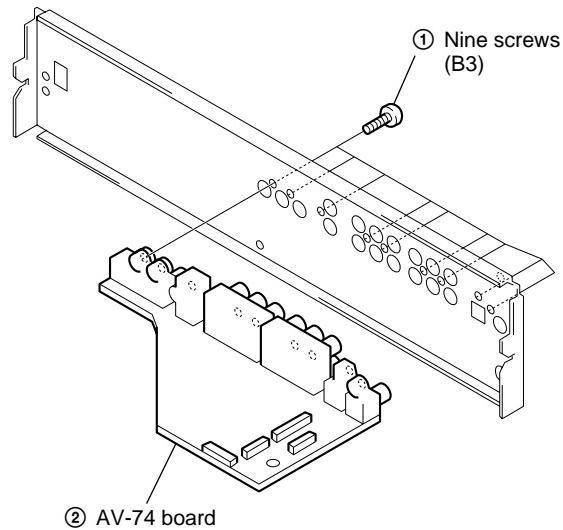
2-4. DV-35 BOARD



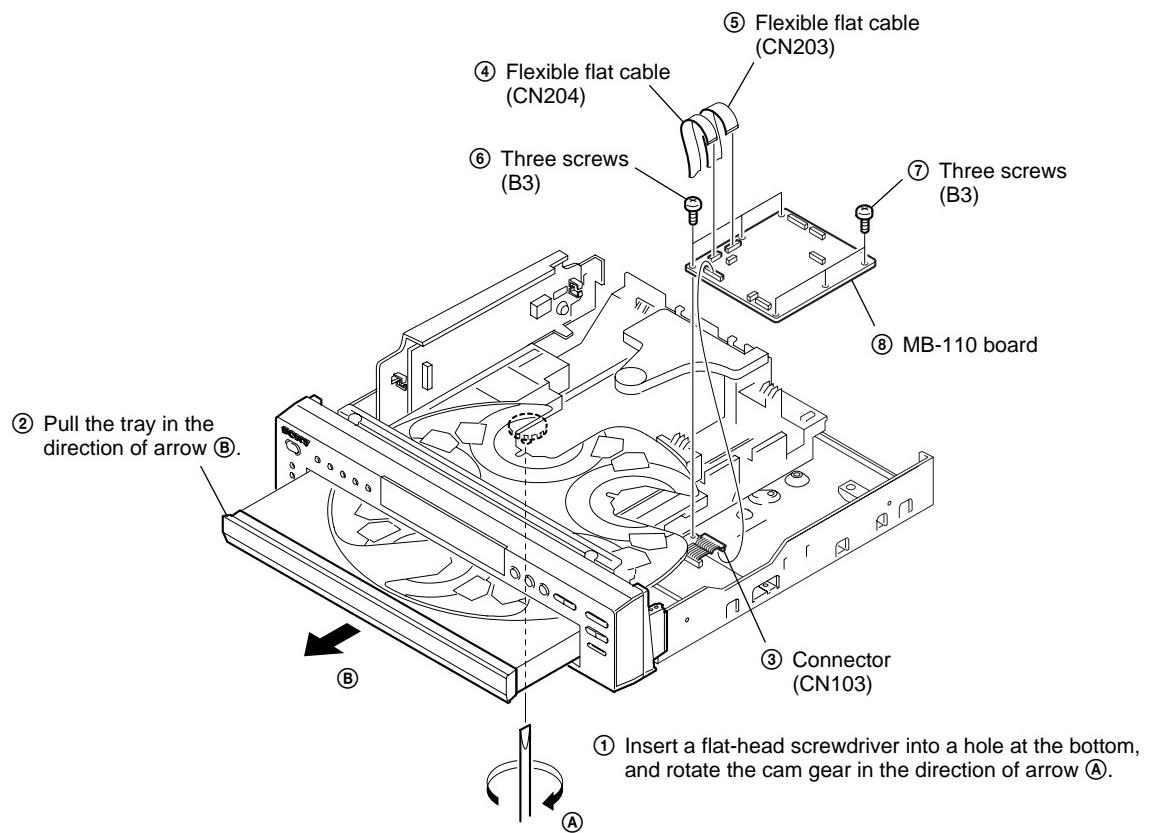
2-5. REAR PANEL SECTION



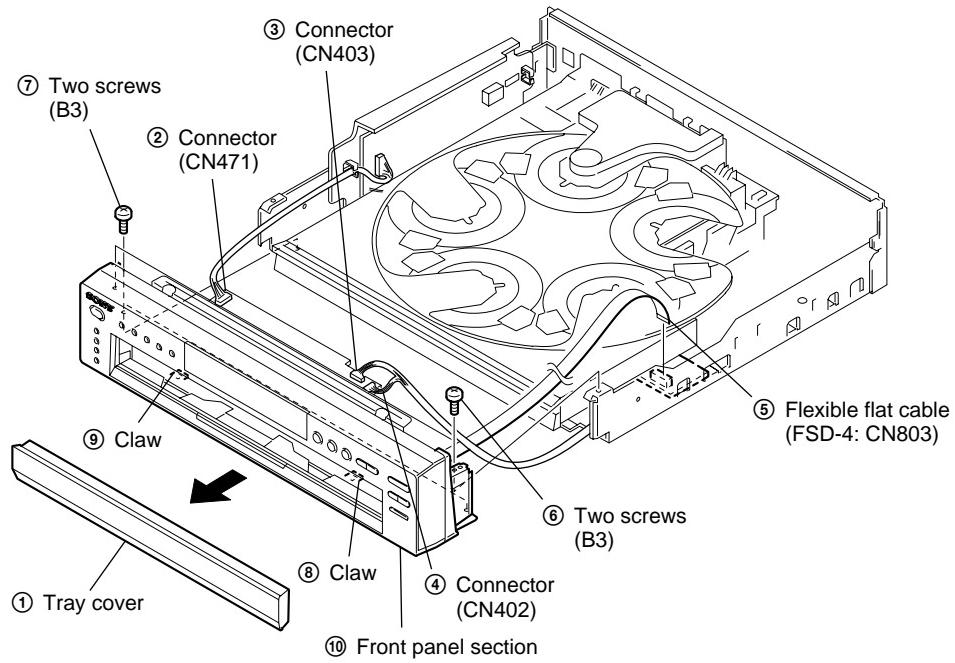
2-6. AV-74 BOARD



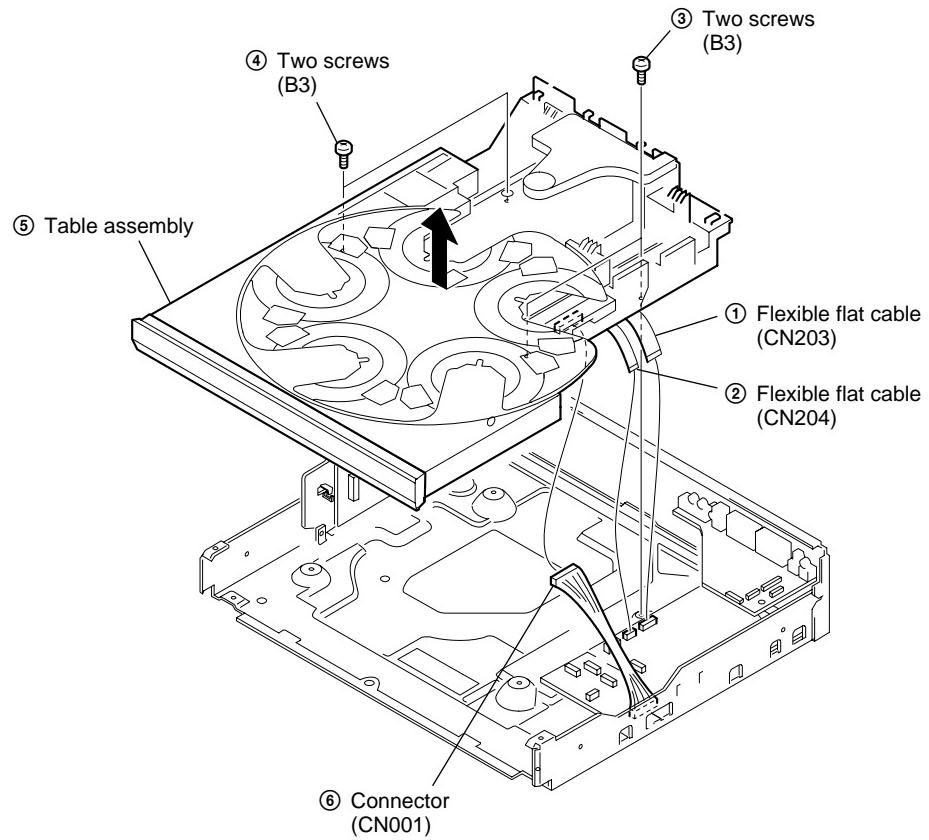
2-7. MB-110 BOARD



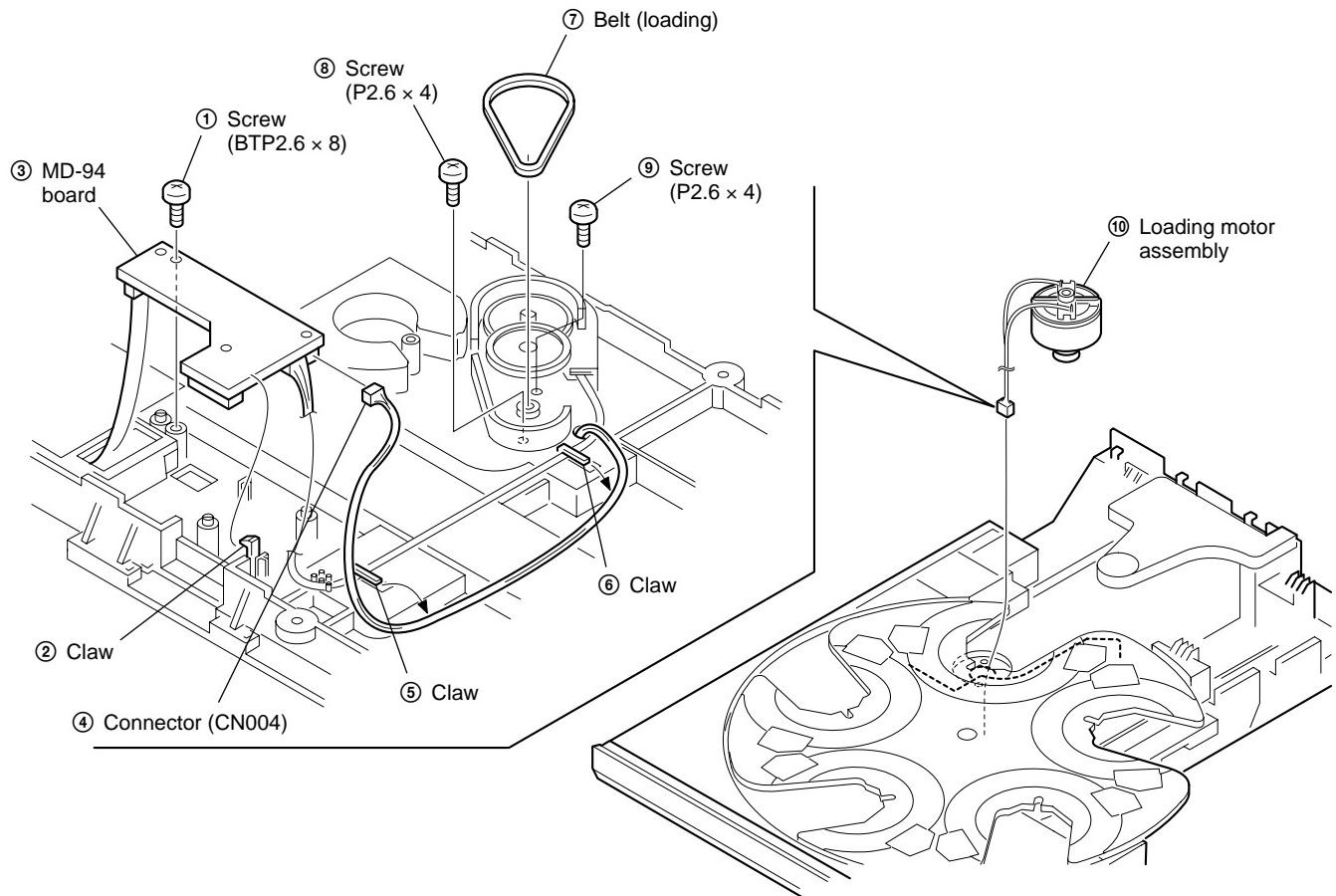
2-8. FRONT PANEL SECTION



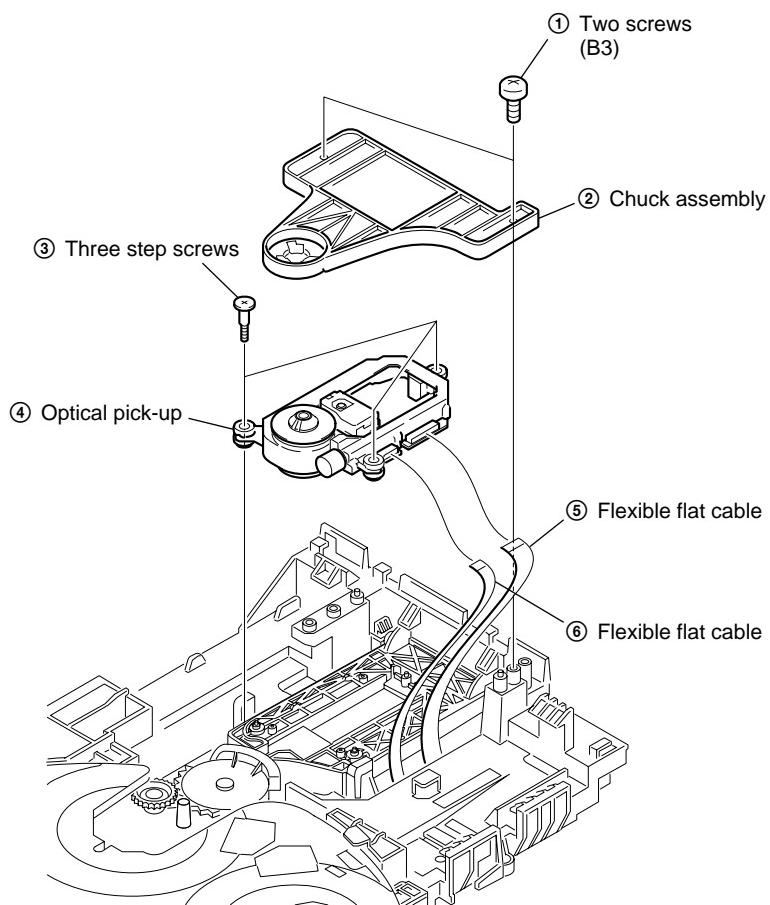
2-9. TABLE ASSEMBLY



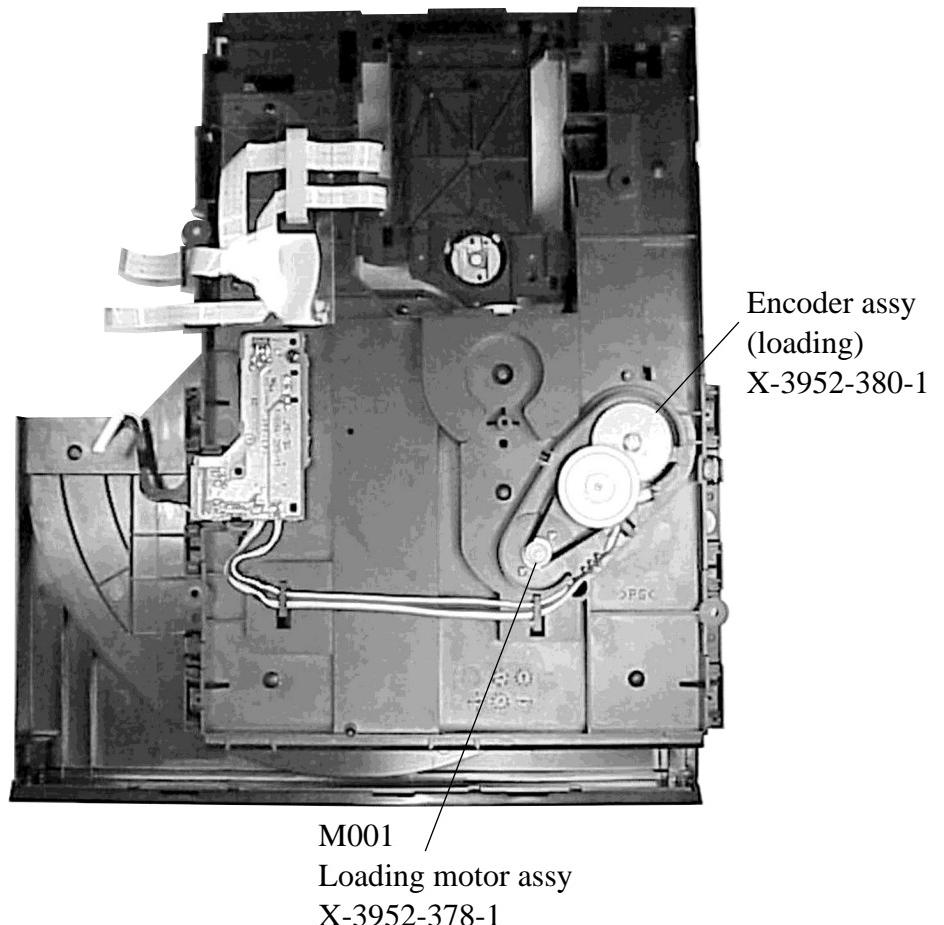
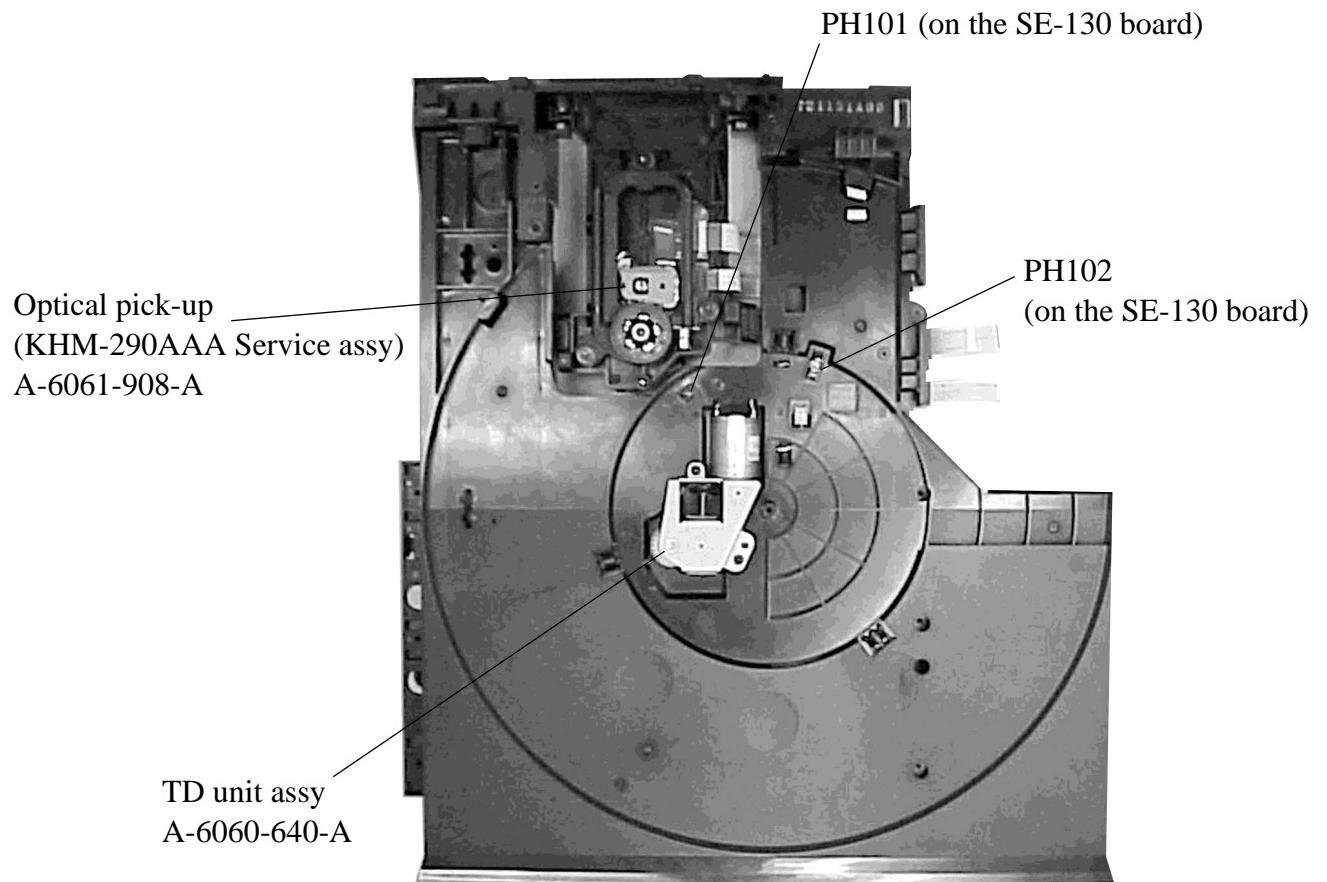
2-10. LOADING MOTOR ASSEMBLY



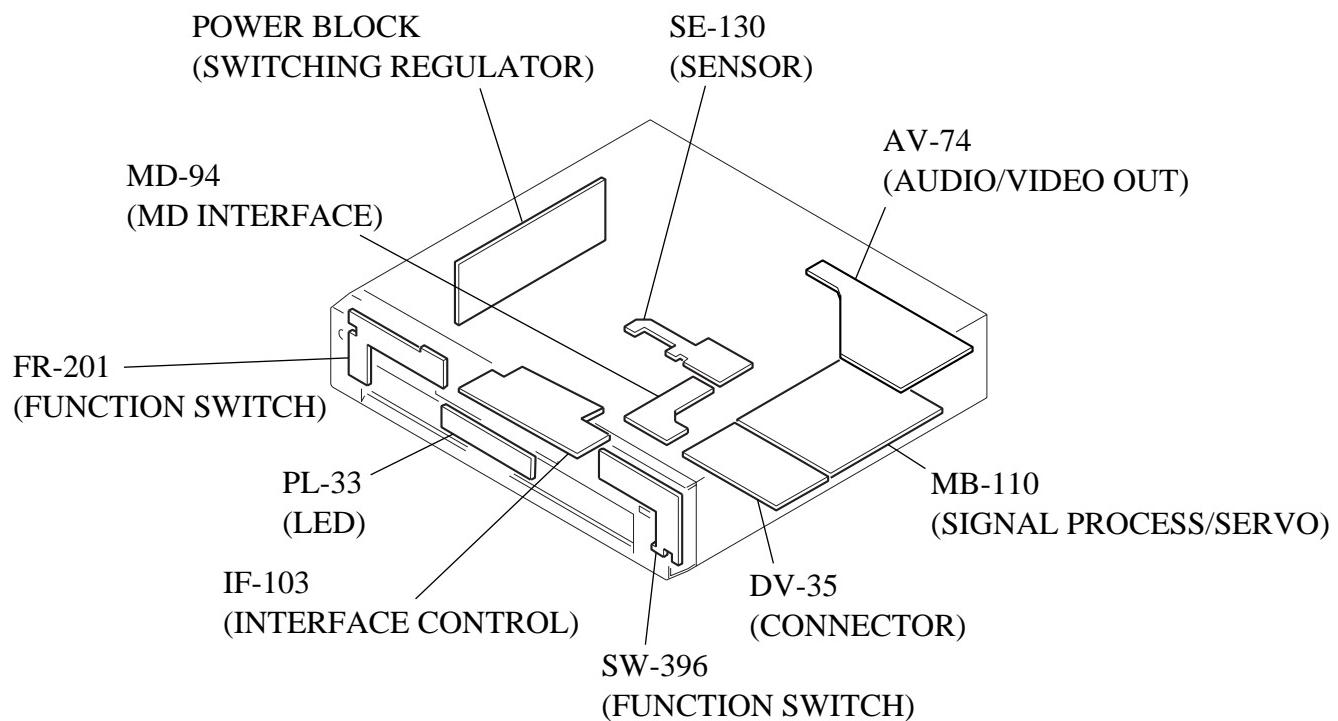
2-11. OPTICAL PICK-UP



2-12. INTERNAL VIEWS

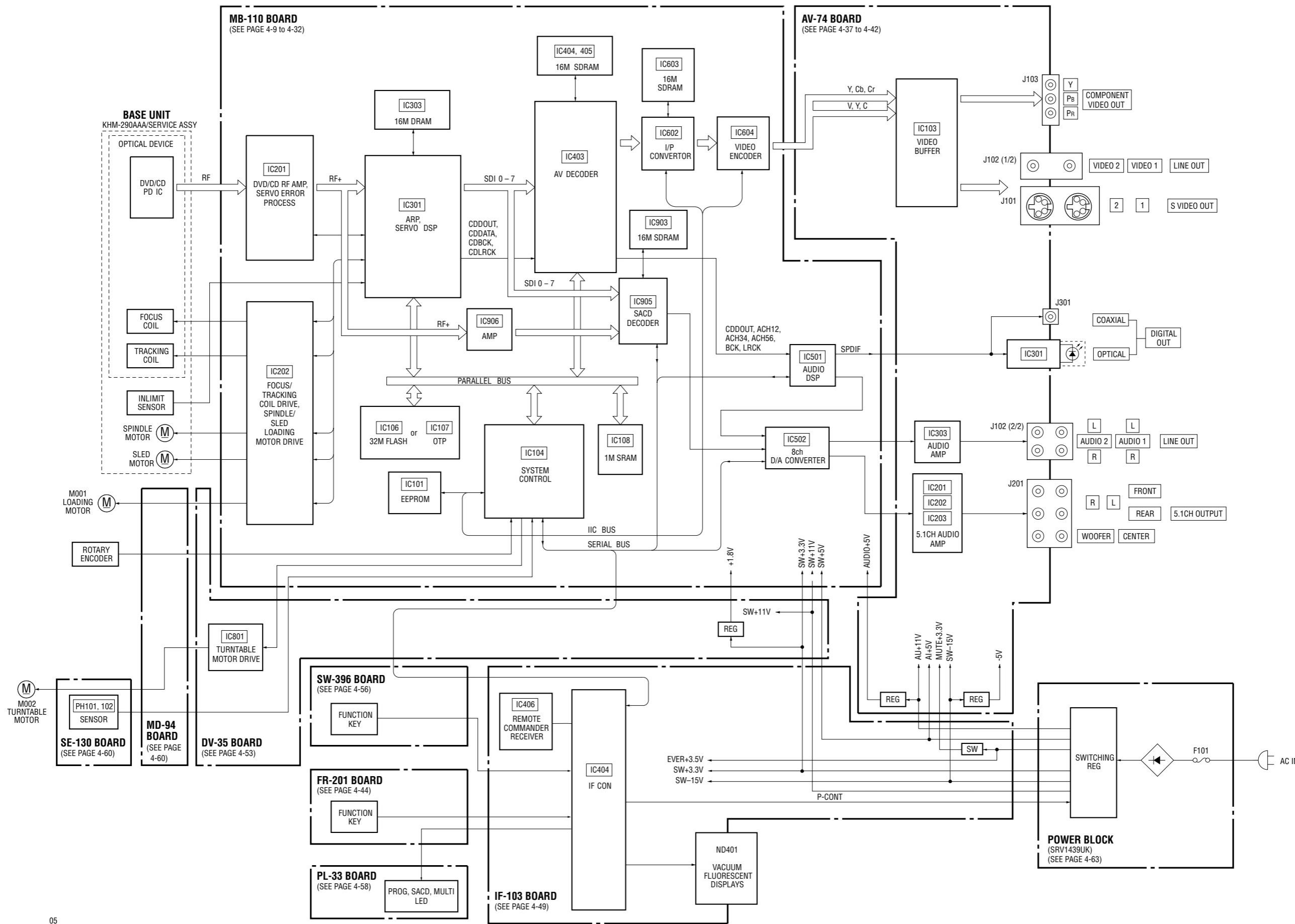


2-13. CIRCUIT BOARDS LOCATION

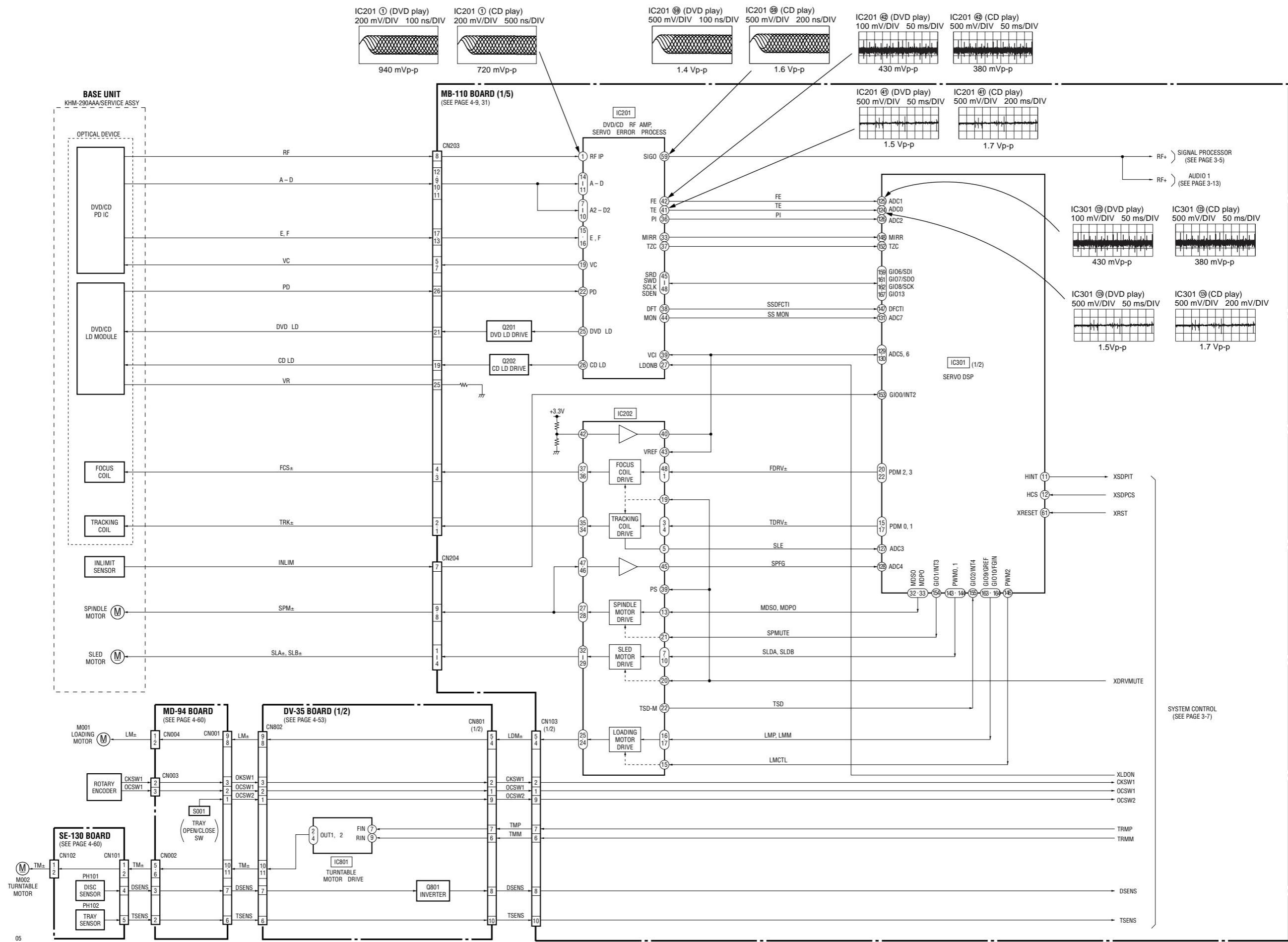


SECTION 3 BLOCK DIAGRAMS

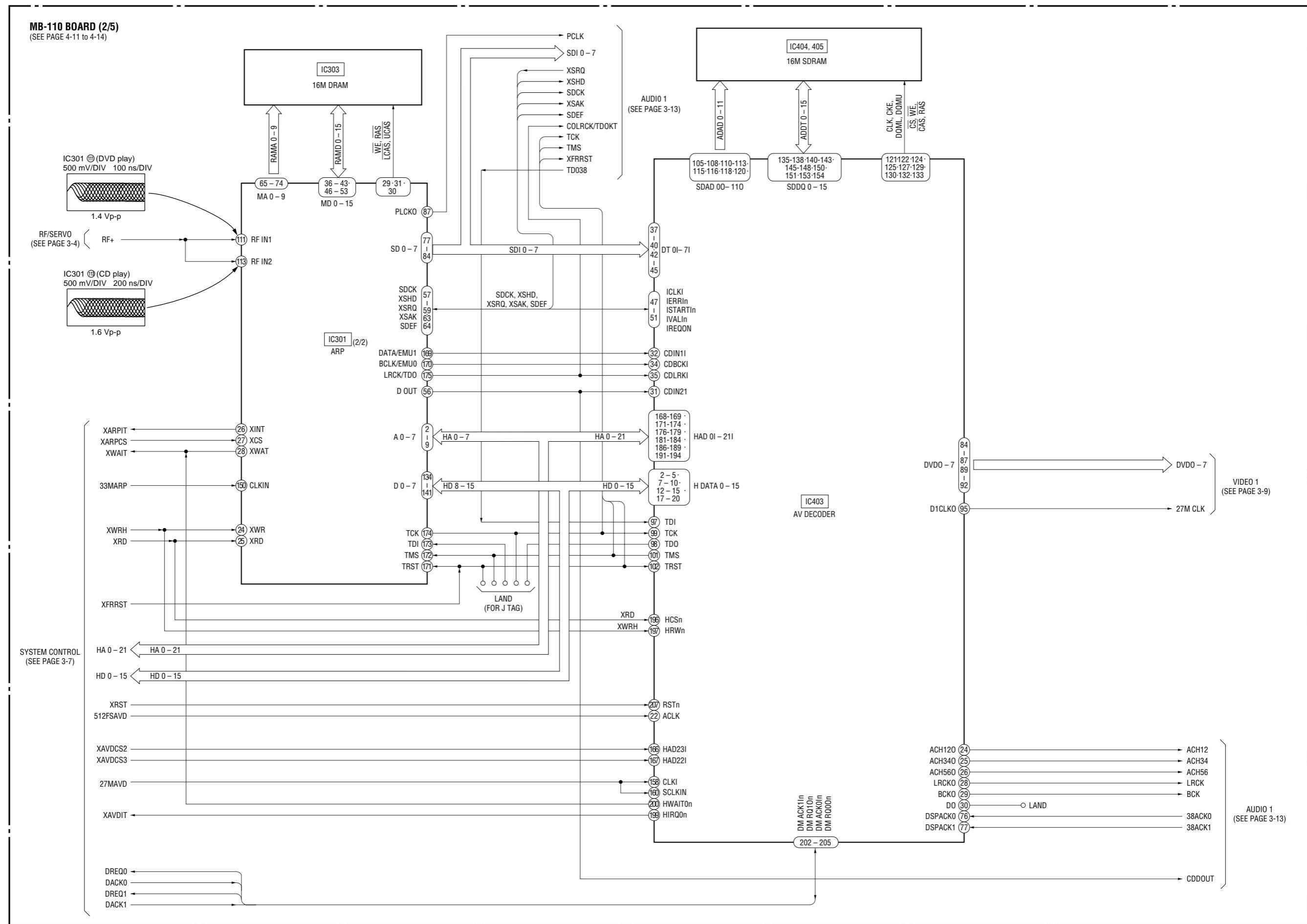
3-1. OVERALL BLOCK DIAGRAM



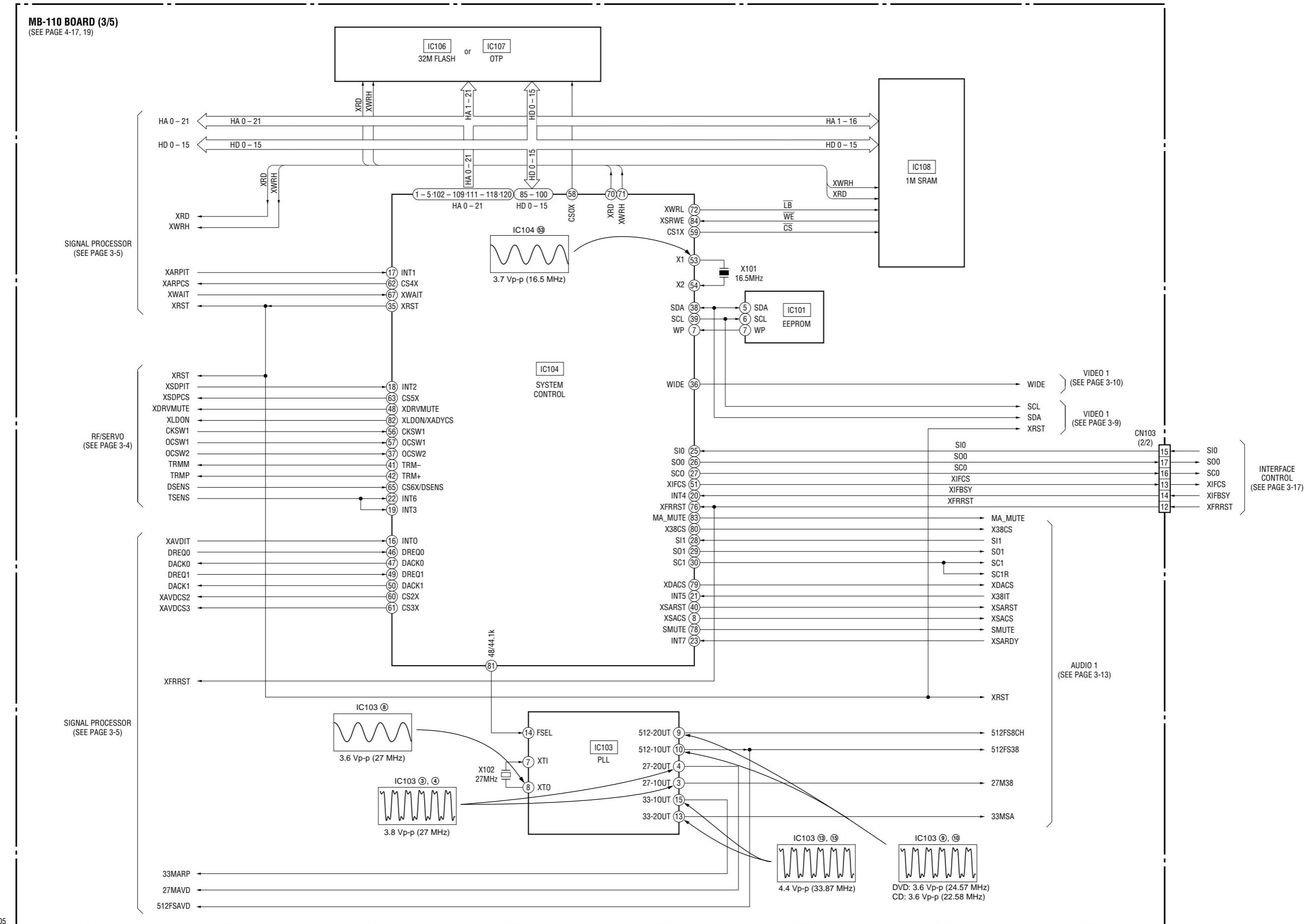
3-2. RF/SERVO BLOCK DIAGRAM



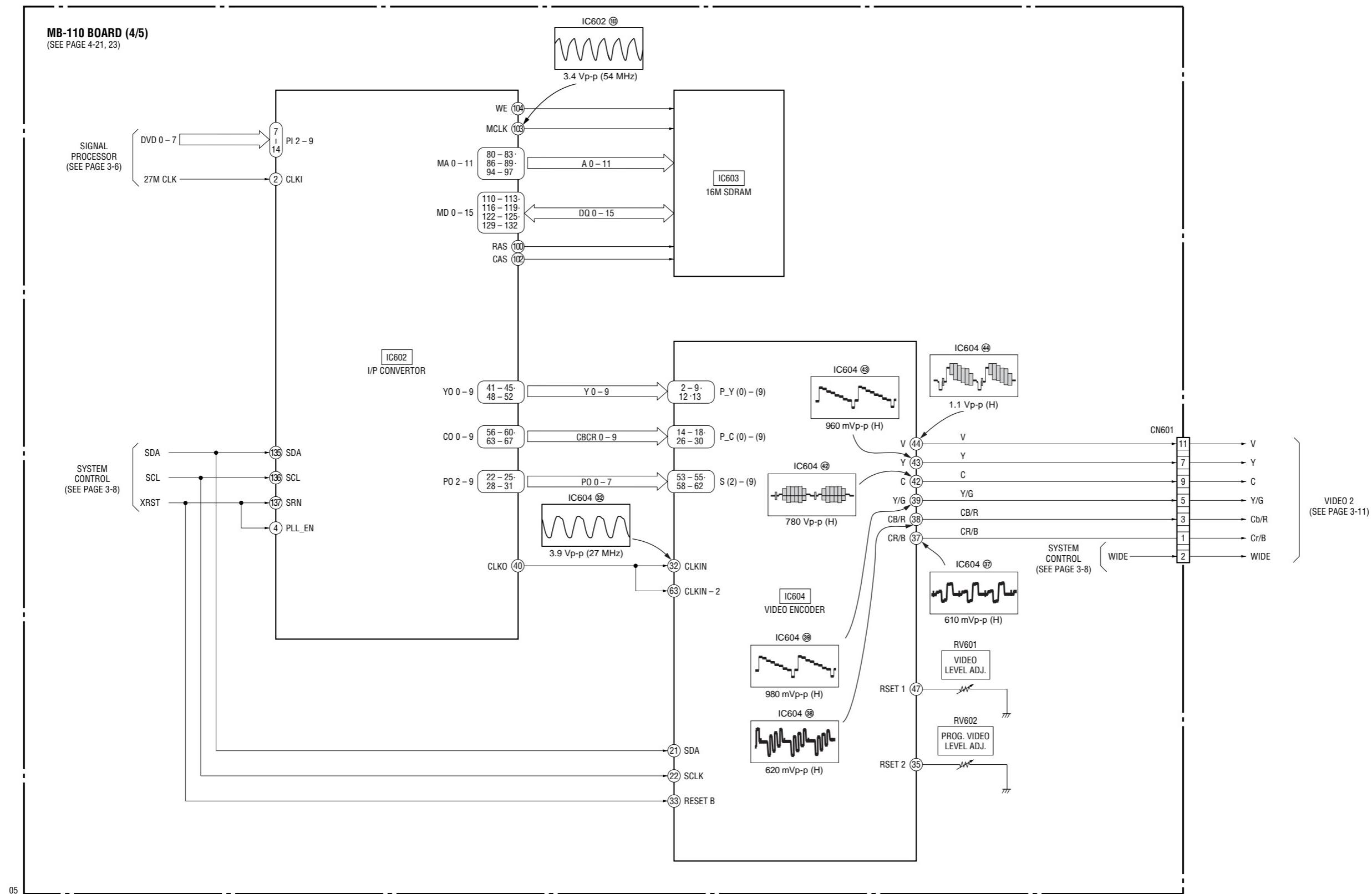
3-3. SIGNAL PROCESSOR BLOCK DIAGRAM



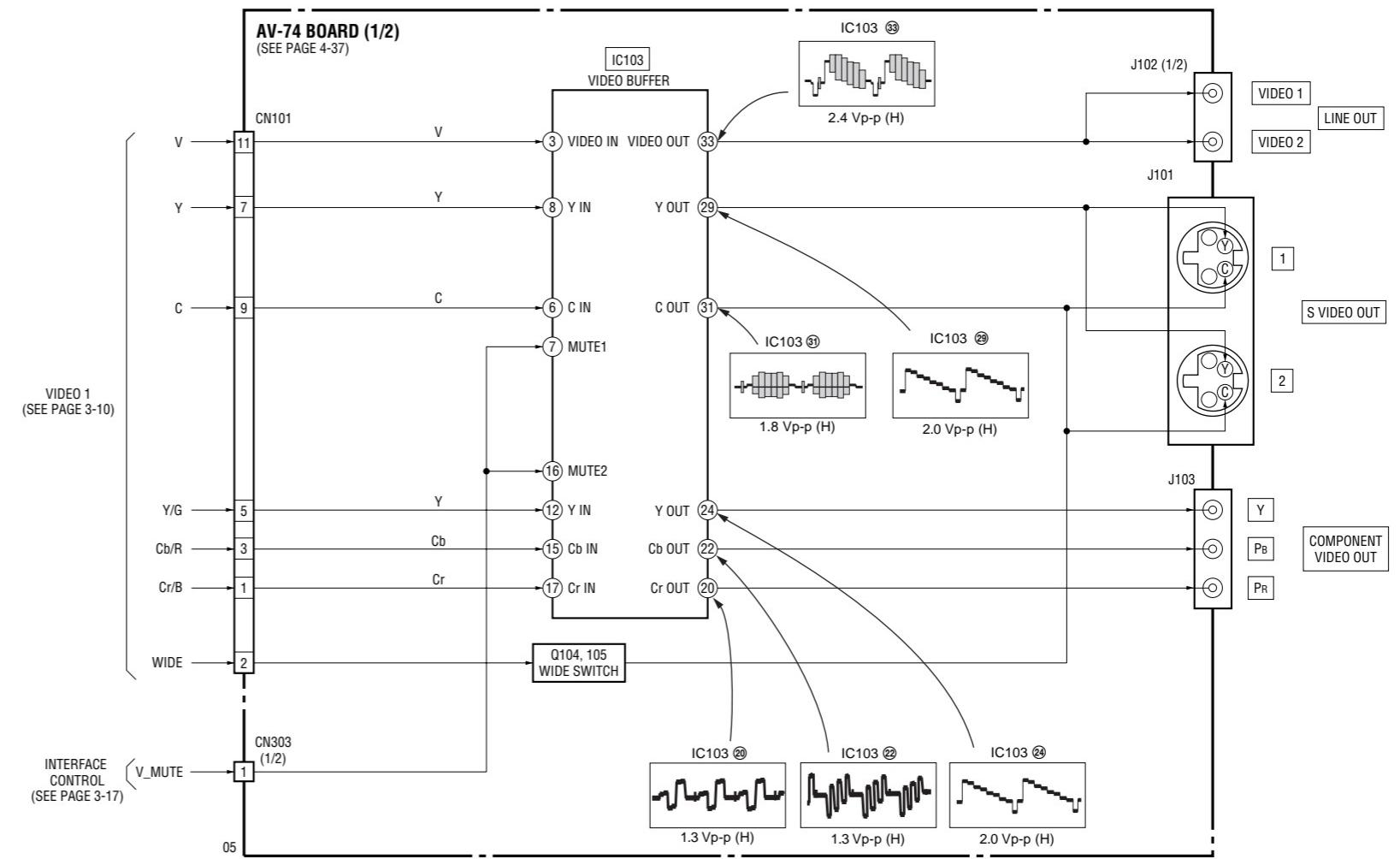
3-4. SYSTEM CONTROL BLOCK DIAGRAM



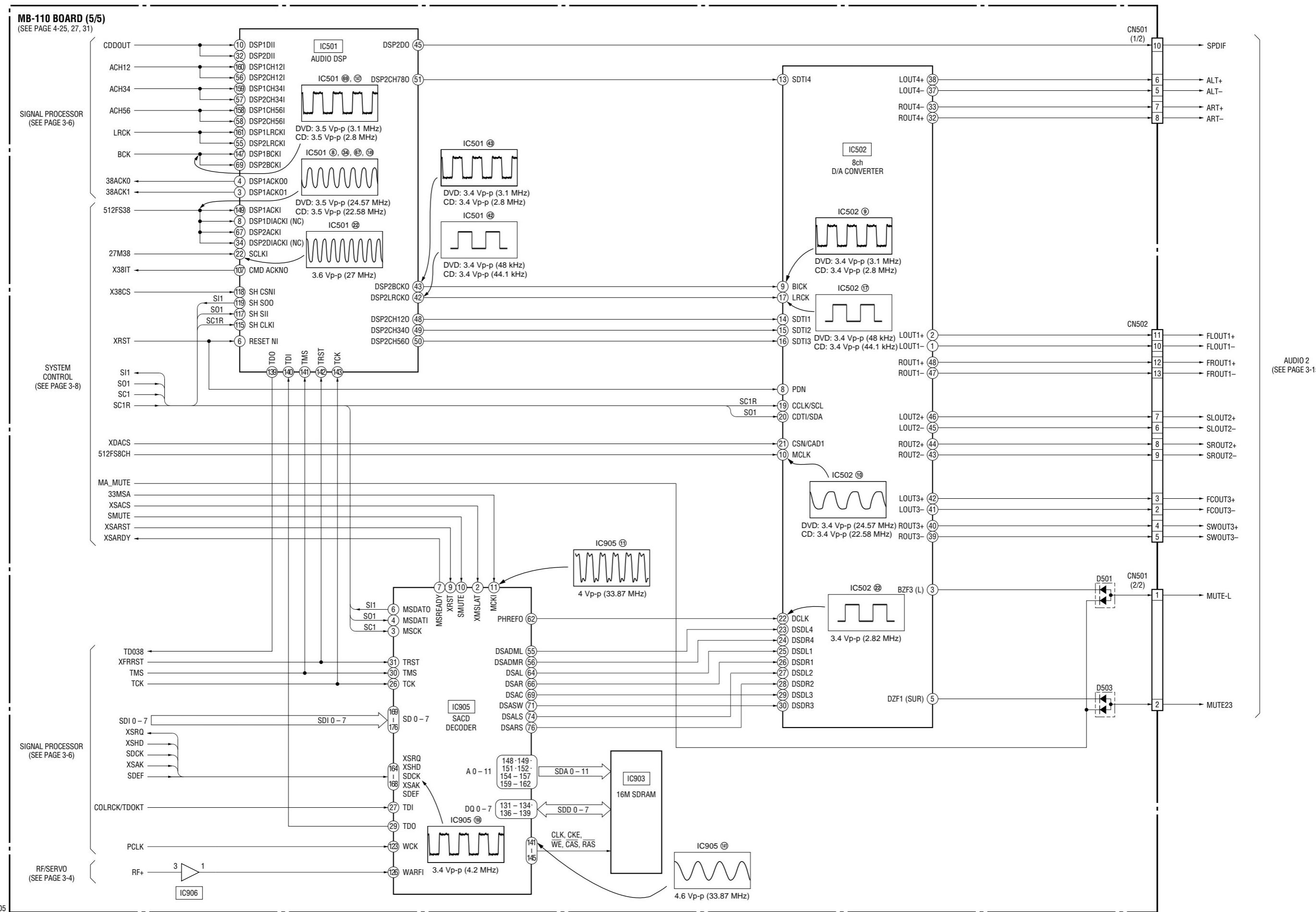
3-5. VIDEO (1) BLOCK DIAGRAM



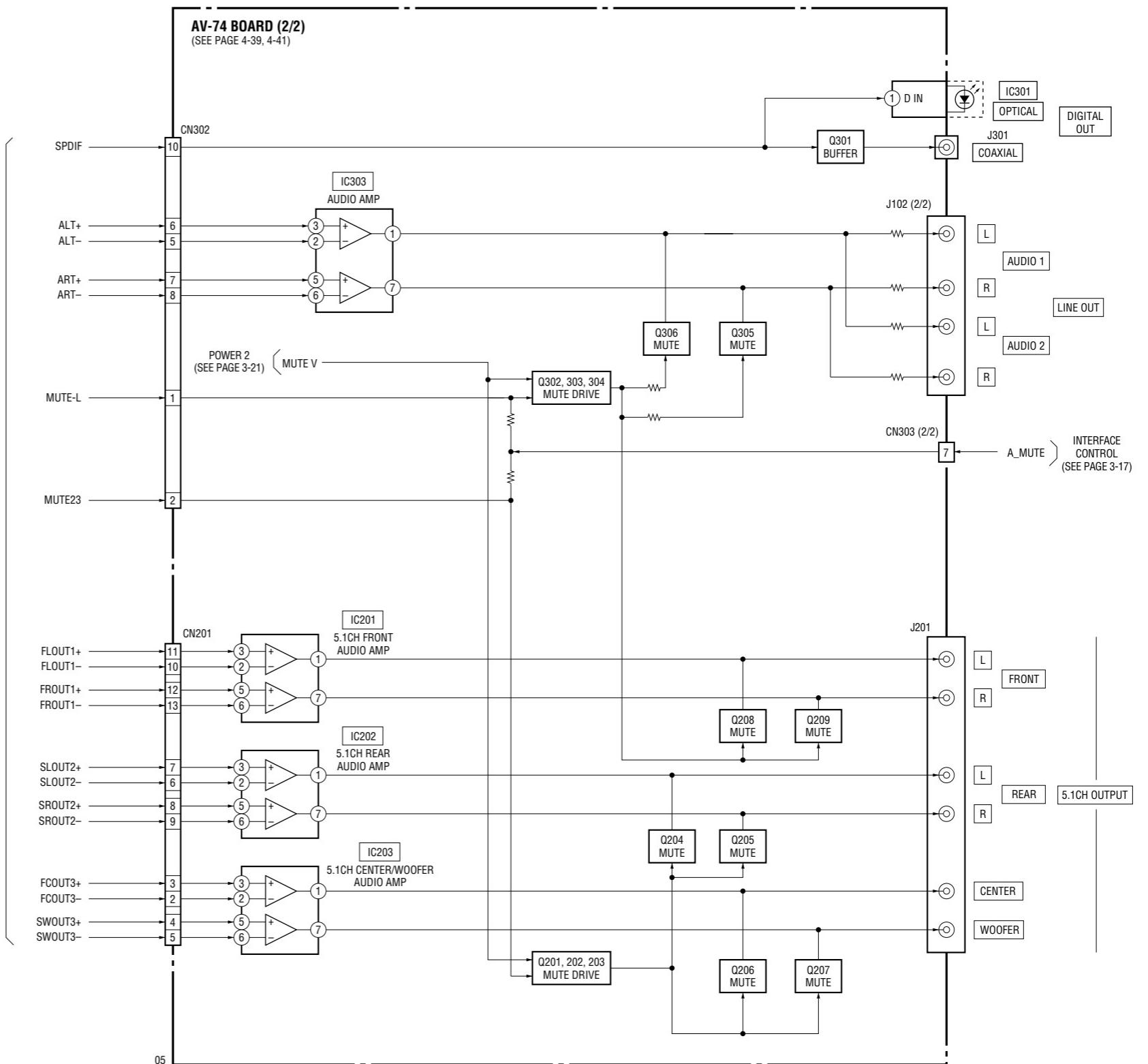
3-6. VIDEO (2) BLOCK DIAGRAM



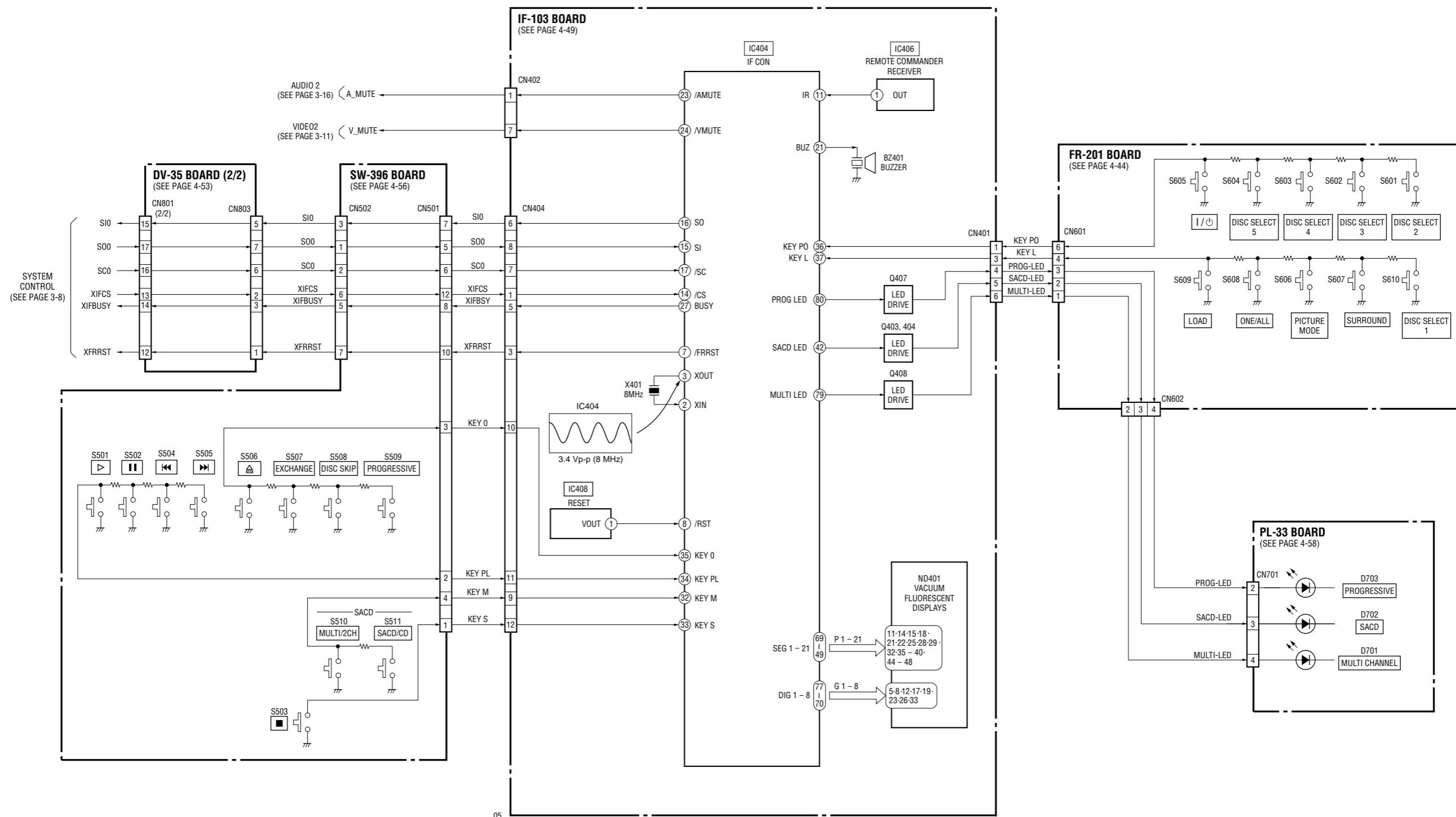
3-7. AUDIO (1) BLOCK DIAGRAM



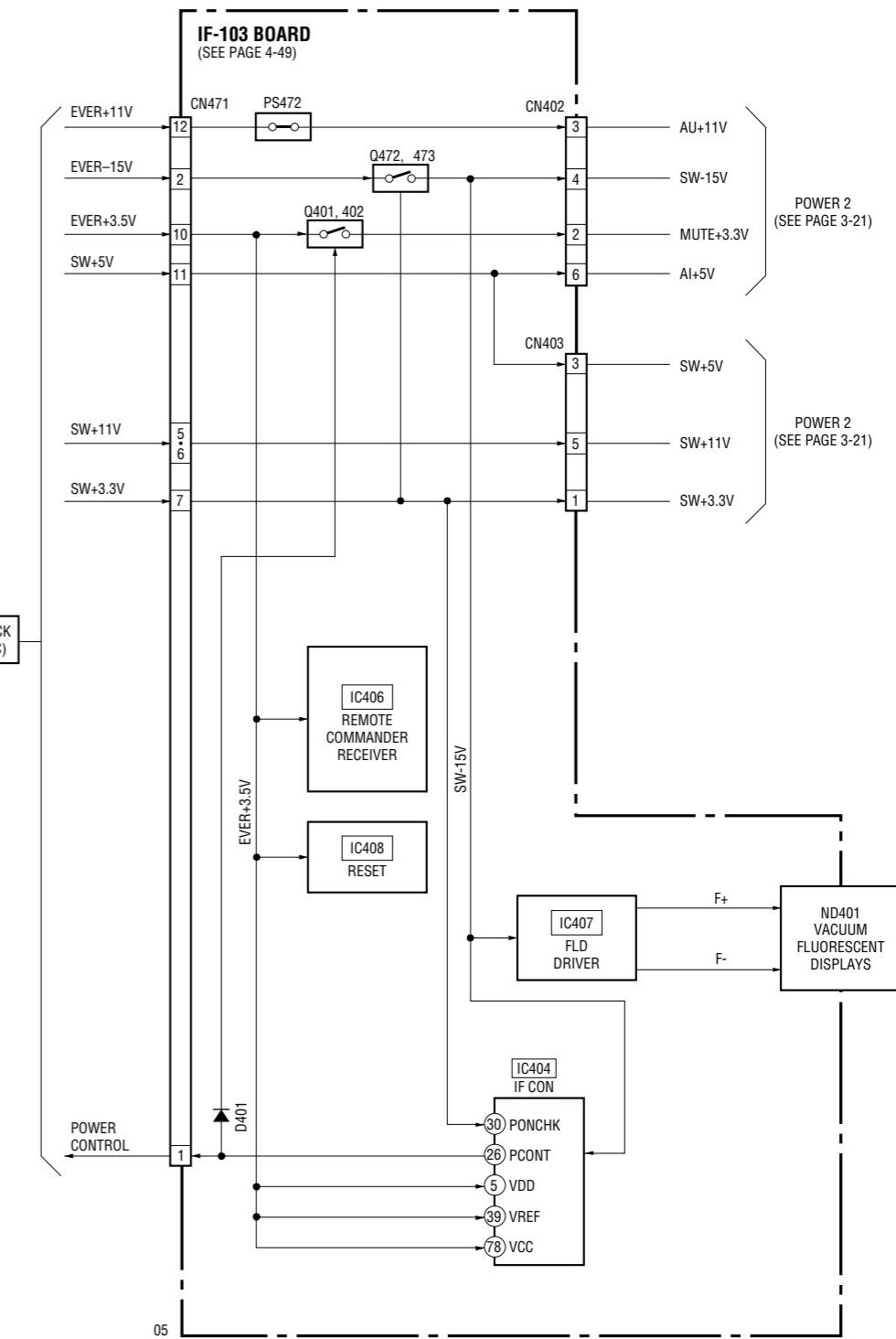
3-8. AUDIO (2) BLOCK DIAGRAM



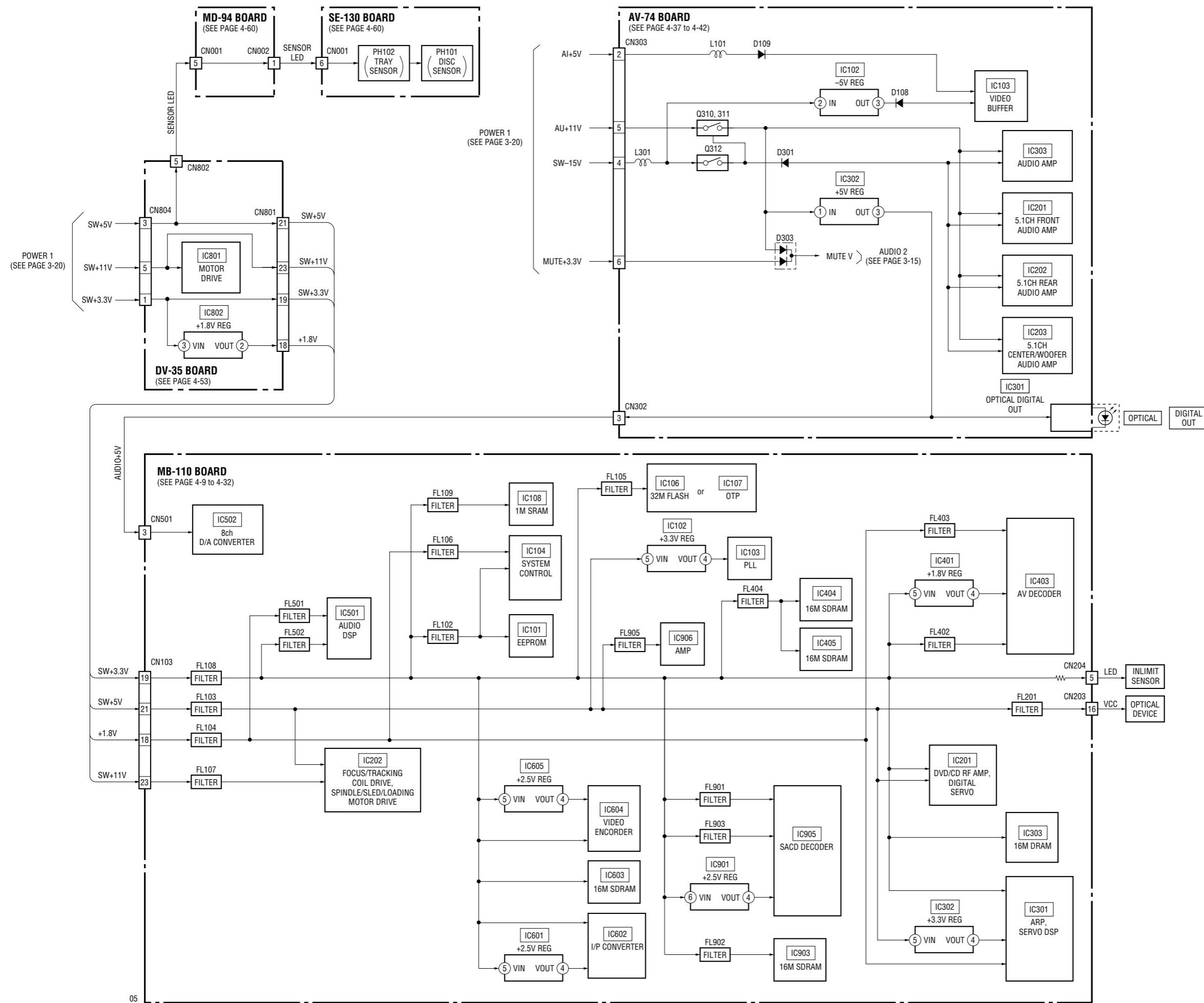
3-9. INTERFACE CONTROL BLOCK DIAGRAM



3-10. POWER (1) BLOCK DIAGRAM



3-11. POWER (2) BLOCK DIAGRAM



SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

**THIS NOTE IS COMMON FOR PRINTED WIRING
BOARDS AND SCHEMATIC DIAGRAMS.**
**(In addition to this, the necessary note is printed
in each block.)**

For printed wiring boards:

- — : indicates a lead wire mounted on the component side.
- — : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ■■■■■ : Pattern from the side which enables seeing.
(The other layers' patterns are not indicated.)

Caution:

Pattern face side:	Parts on the pattern face side seen from (Side A) the pattern face are indicated.
Parts face side:	Parts on the parts face side seen from (Side B) the parts face are indicated.

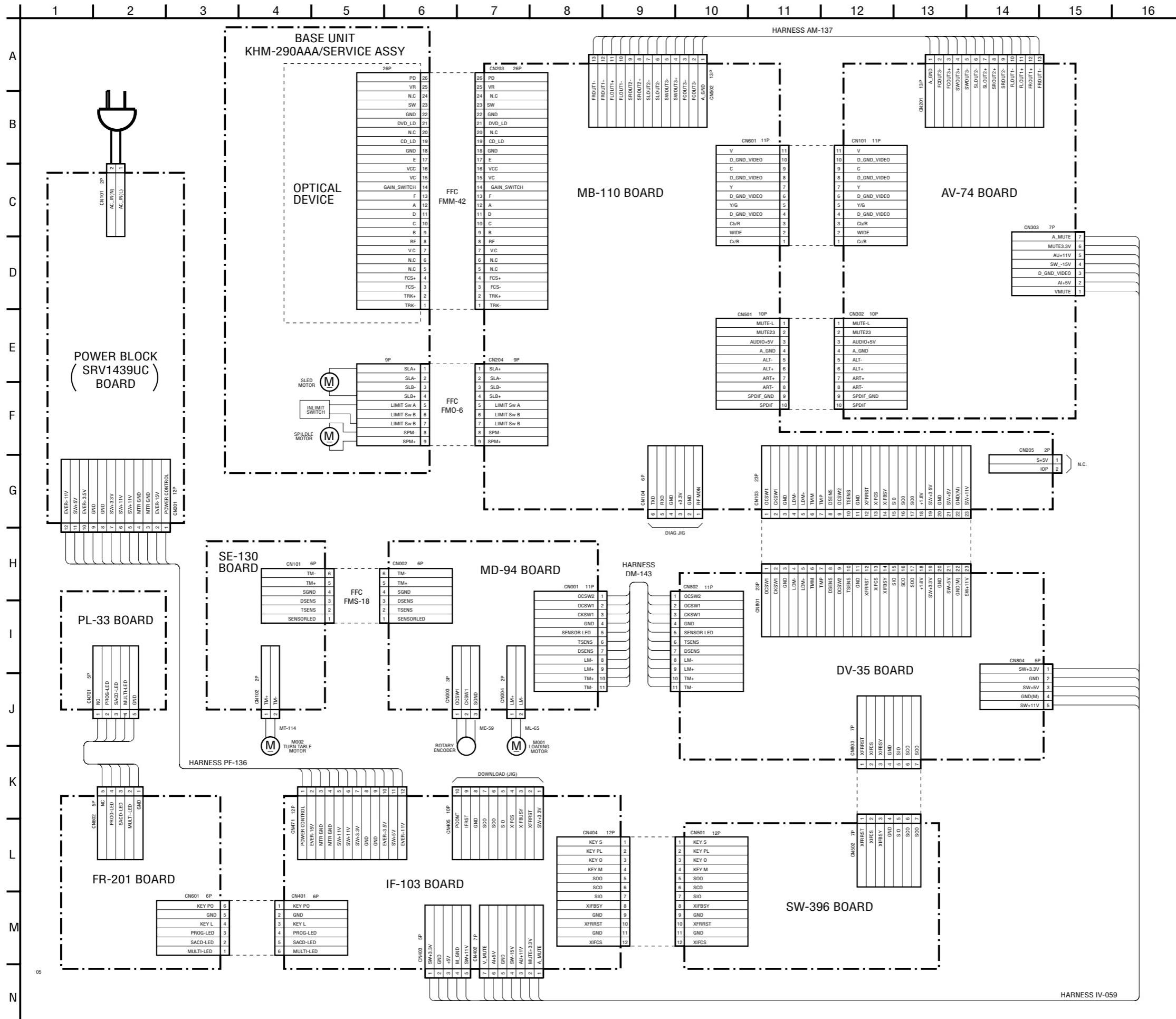
For schematic diagram:

- Caution when replacing chip parts.
New parts must be attached after removal of chip.
Be careful not to heat the minus side of tantalum capacitor,
because it is damaged by the heat.
- All resistors are in ohms, $\frac{1}{4}$ W (Chip resistors : $\frac{1}{10}$ W) unless otherwise specified.
 $k\Omega$: 1000Ω , $M\Omega$: $1000k\Omega$.
- All capacitors are in μF unless otherwise noted. pF : $\mu\mu F$
50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
-  : nonflammable resistor.
-  : fusible resistor.
-  : panel designation.
-  : internal component.
-  : adjustment for repair.
-  : B+ Line.
-  : B- Line.
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signal on DVD reference disc and when playing CD reference disc.
- Readings are taken with a digital multimeter (DC $10M\Omega$).
- Voltage variations may be noted due to normal production tolerances.

Note: The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

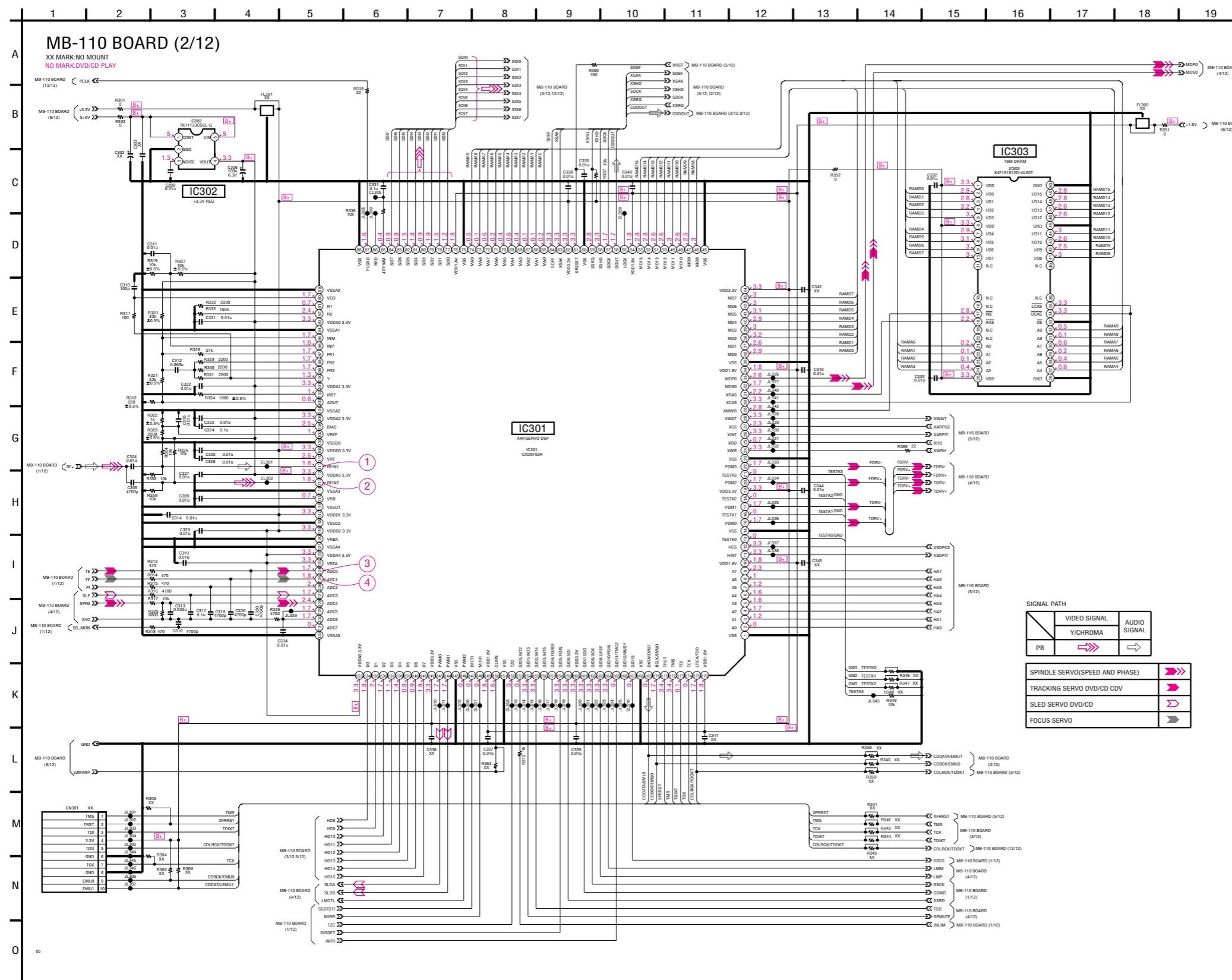
When indicating parts by reference number, please include the board name.

4-1. FRAME SCHEMATIC DIAGRAM

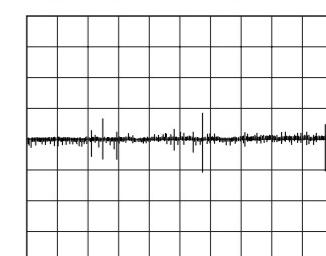


MB-110 (ARP, SERVO DSP) SCHEMATIC DIAGRAM

- Ref. No.: MB-110 board; 2,000 series -

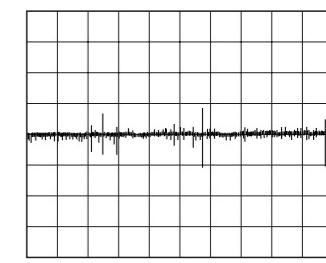


③ IC301 ⑫ (DVD play)
500 mV/DIV, 50 ms/DIV



1.5 Vp-p

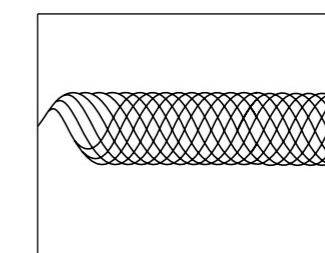
③ IC301 ⑩ (CD play)
500 mV/DIV 200 ms/DIV



1.7 Vp-p

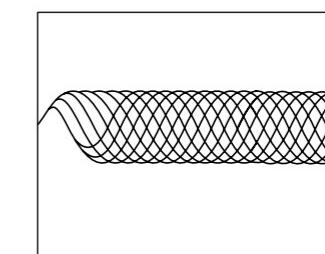
- Waveforms

① IC301 ⑪ (DVD play)
500 mV/DIV 100 ns/DIV



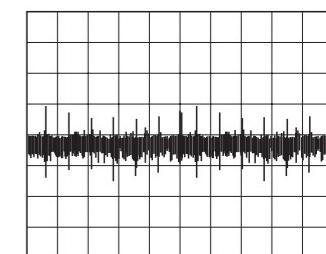
1.4 Vp-p

② IC301 ⑪ (CD play)
500 mV/DIV 200 ns/DIV



1.4 Vp-p

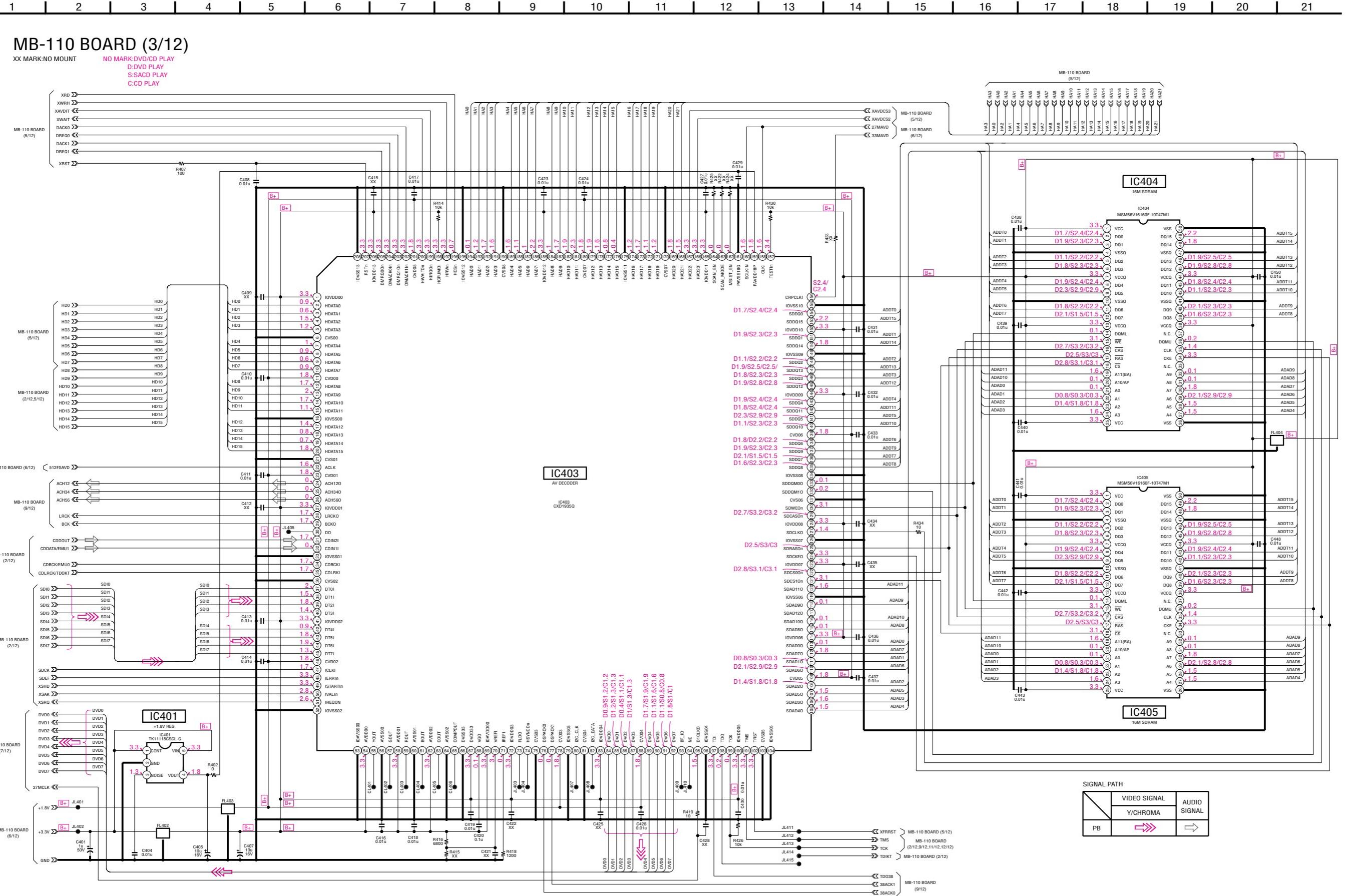
④ IC301 ⑯ (CD play)
500 mV/DIV 50 ms/DIV



380 mVp-p

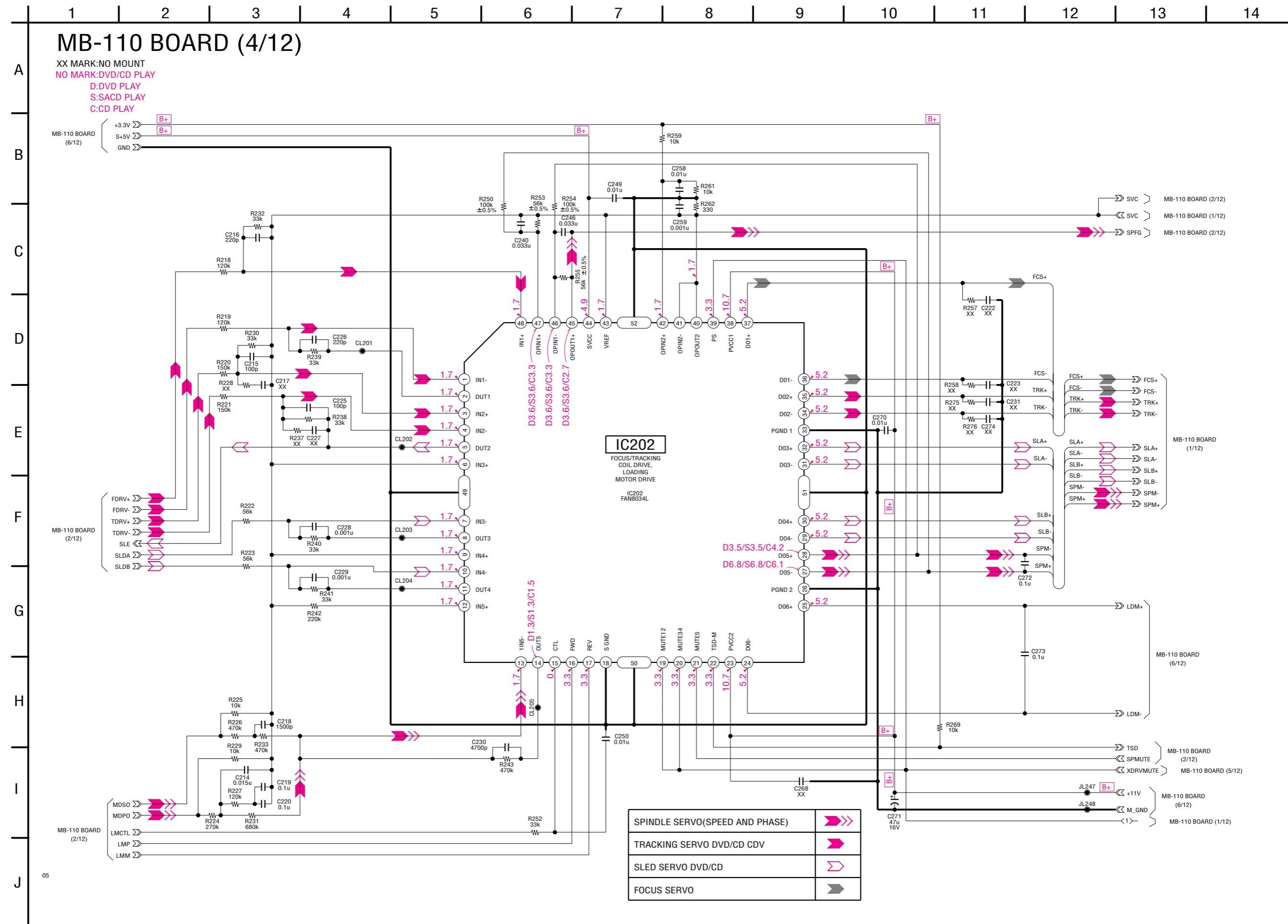
MB-110 (AV DECODER) SCHEMATIC DIAGRAM

- Ref. No.: MB-110 board; 2,000 series -



MB-110 (MOTOR DRIVE) SCHEMATIC DIAGRAM

– Ref. No.: MB-110 board; 2,000 series –

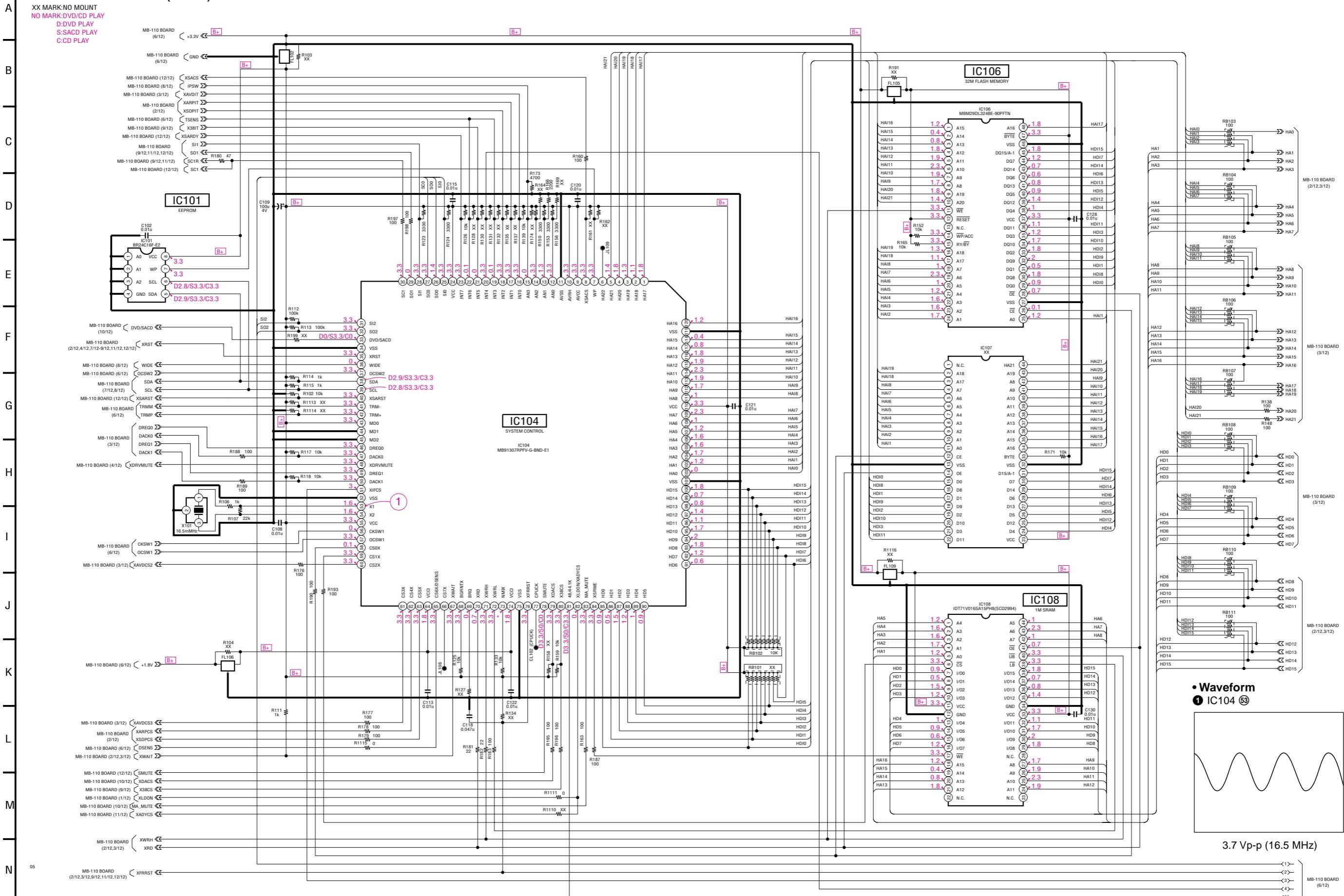


MB-110 (SYSTEM CONTROL) SCHEMATIC DIAGRAM

Ref. No.: MB-110 board; 2,000 series -

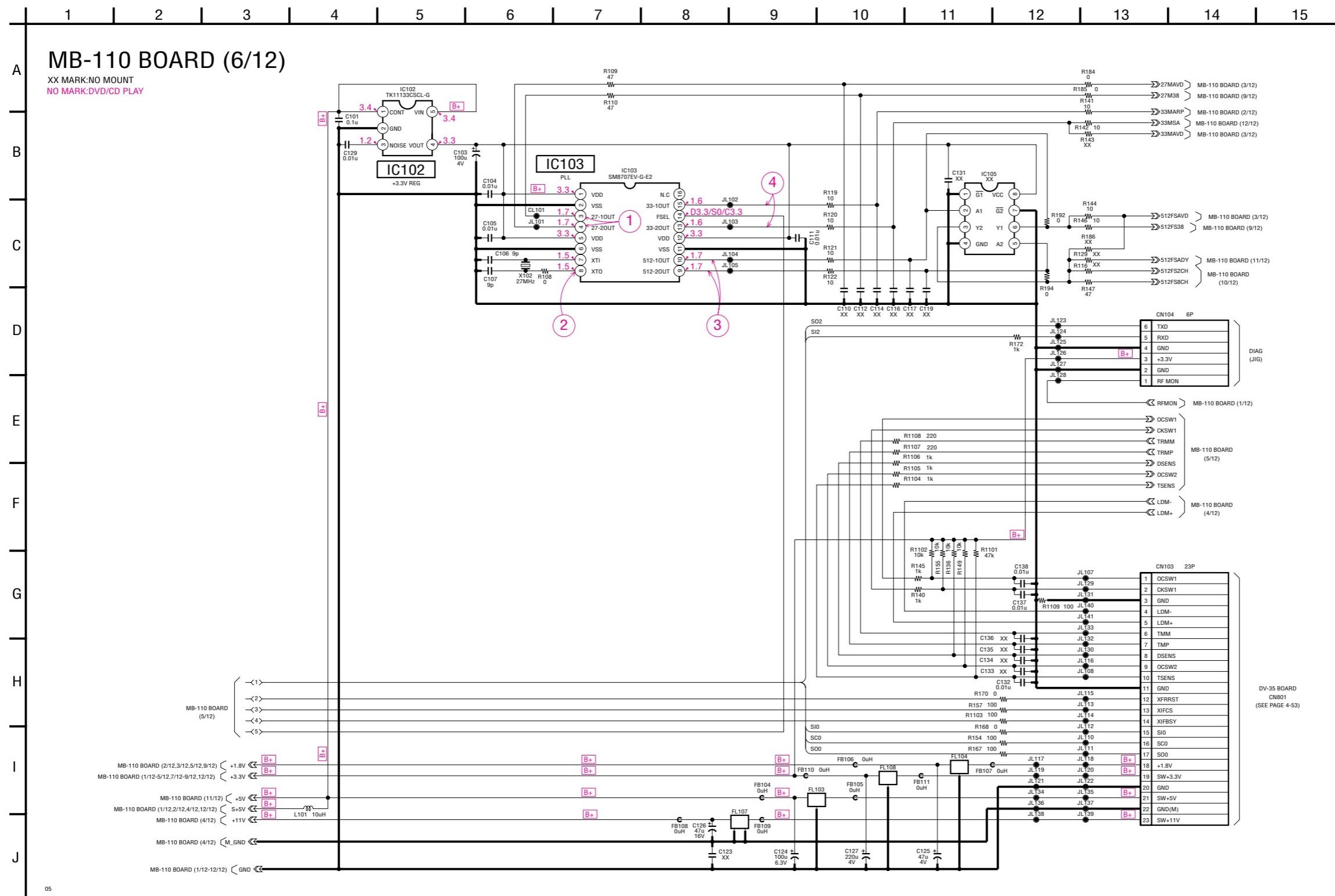
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

MB-110 BOARD (5/12)



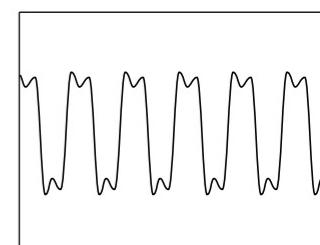
MB-110 (CLOCK GENERATOR) SCHEMATIC DIAGRAM

- Ref. No.: MB-110 board; 2,000 series -

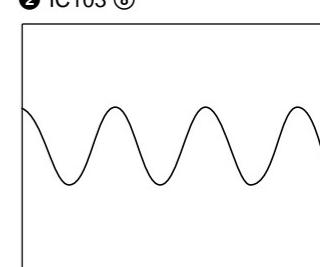


• Waveforms

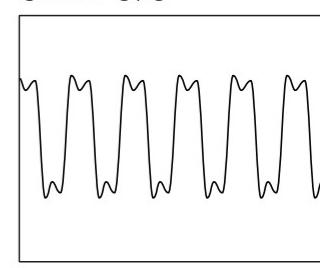
① IC103 ③, ④



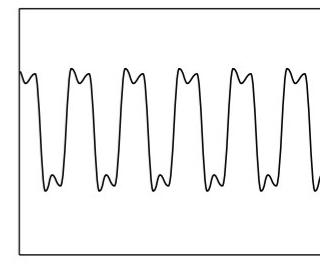
② IC103 ⑧



③ IC103 ⑨, ⑩

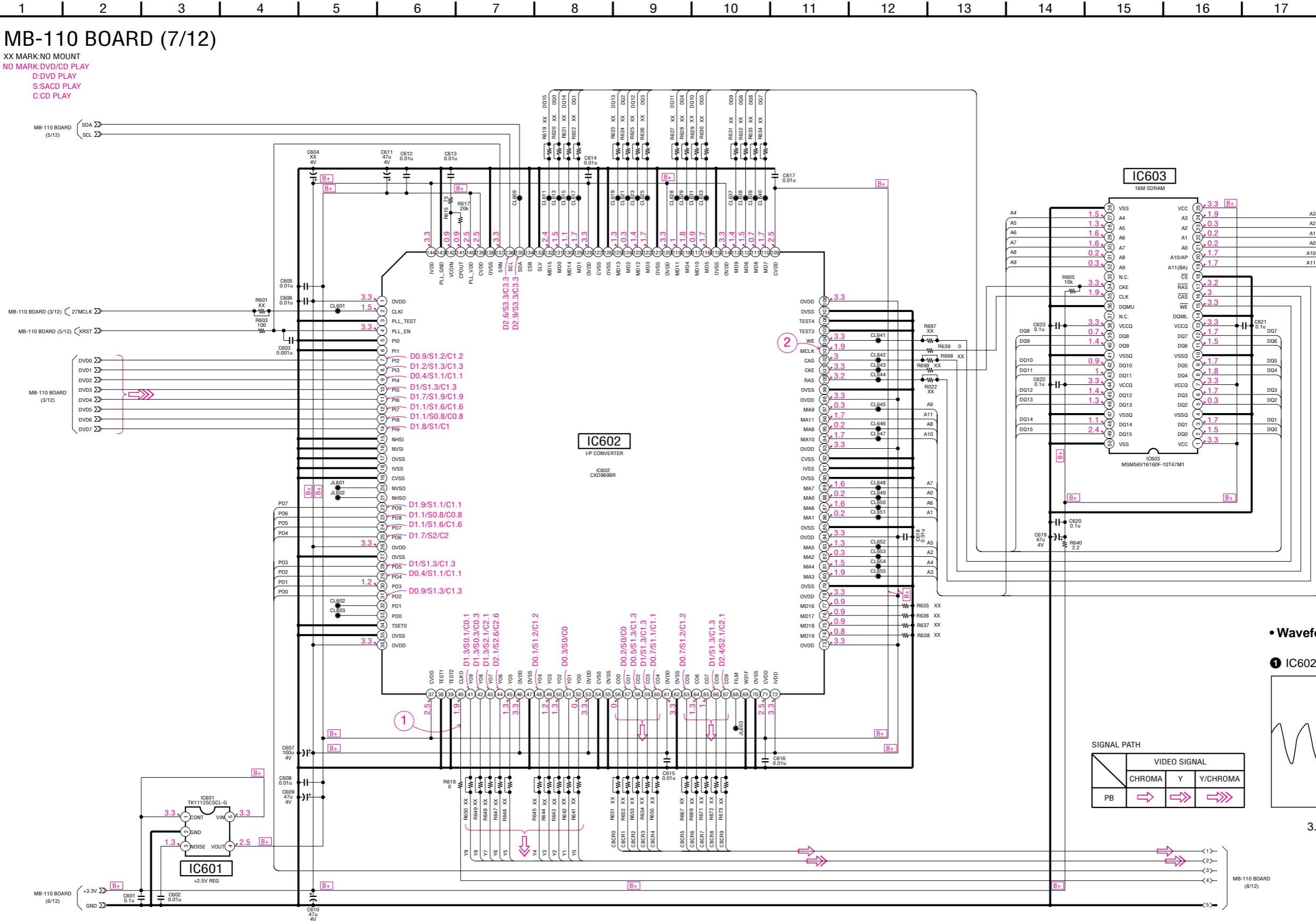


④ IC103 ⑬, ⑯



MB-110 (I/P CONVERTER) SCHEMATIC DIAGRAM

– Ref. No.: MB-110 board; 2,000 series –

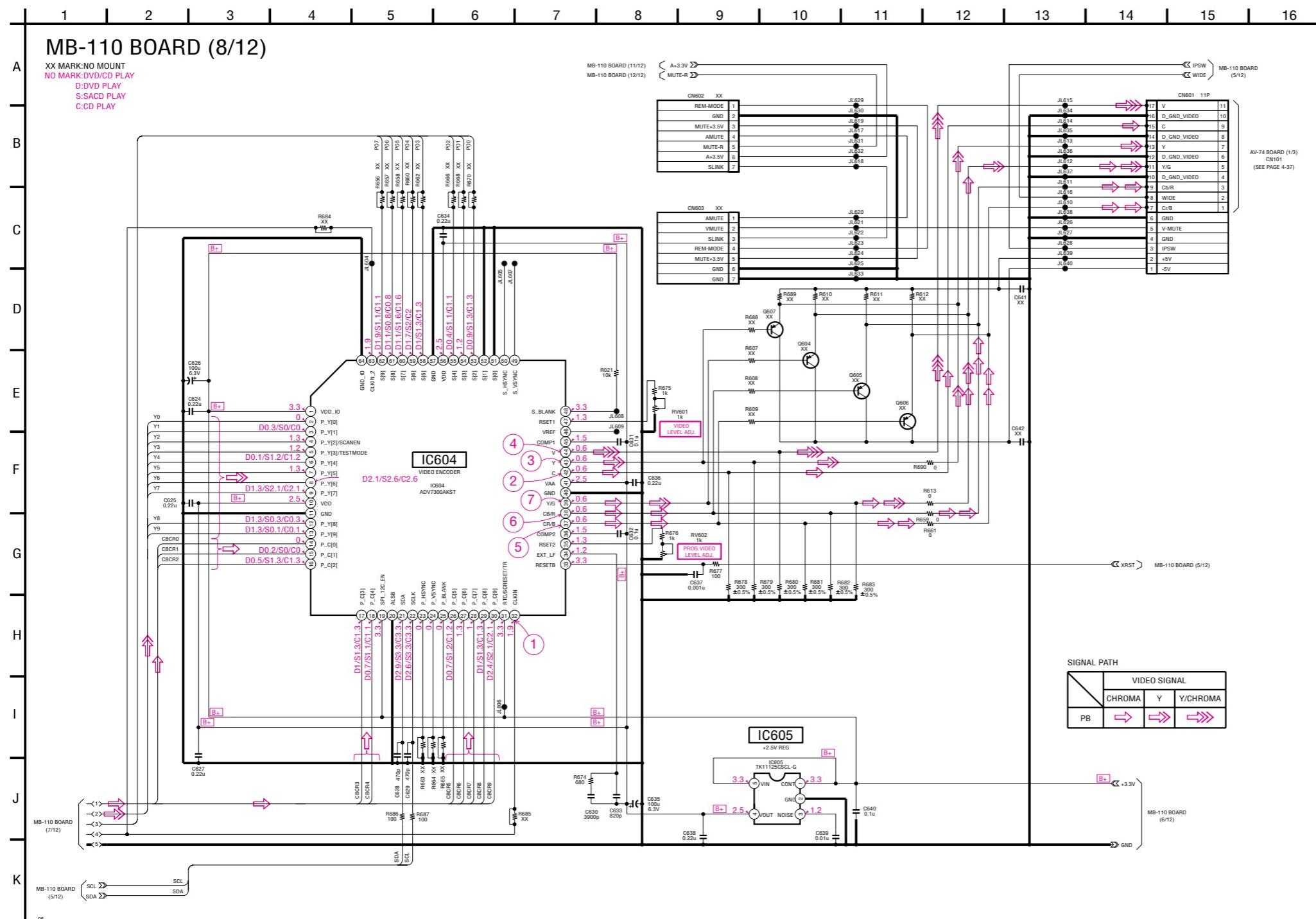


I/P CONVERTER

MB-110 (7/12)

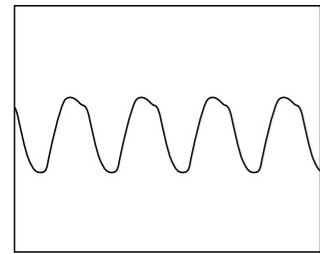
MB-110 (VIDEO ENCODER) SCHEMATIC DIAGRAM

- Ref. No.: MB-110 board; 2,000 series -



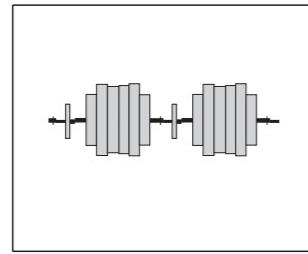
- Waveforms

1 IC604 32



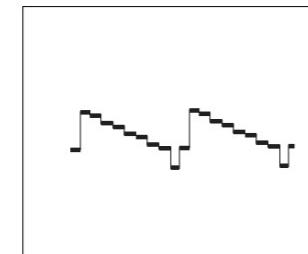
3.4 Vp-p (27 MHz)

2 IC604 42



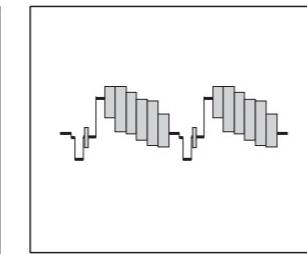
780 mVp-p (H)

③ IC604 ④



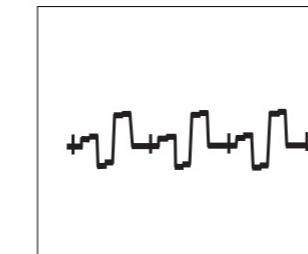
960 mVp-p (H)

4 IC604 4



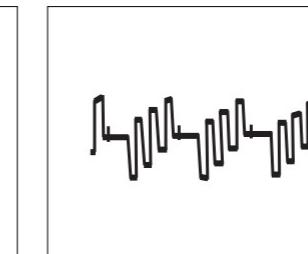
1.1 Vp-p (

⑤ IC604



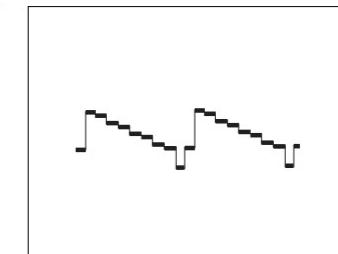
610 mVp-p (

⑥ IC604



620 mVp-p

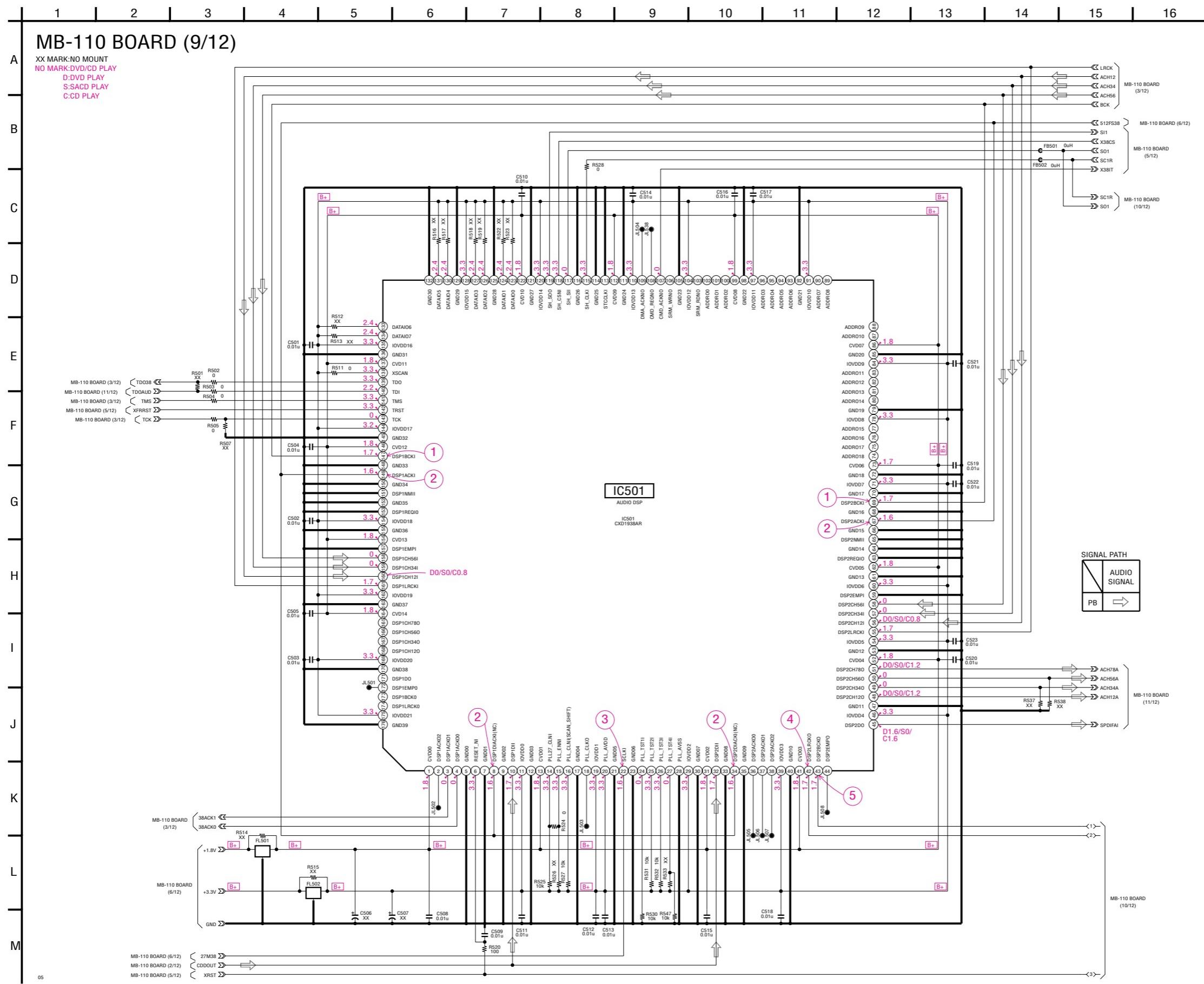
⑦ IC604 ③



980 mVp-p (H)

MB-110 (AUDIO DSP) SCHEMATIC DIAGRAM

- Ref. No.: MB-110 board; 2,000 series -

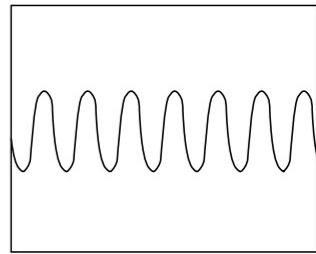


• Waveforms

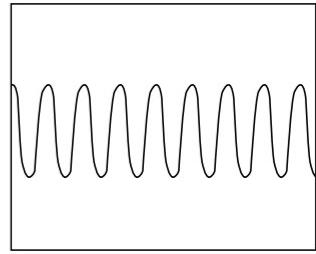
① IC501 ⑥, ⑭

DVD : 3.5 Vp-p (3.1 MHz)
CD : 3.5 Vp-p (2.8 MHz)

② IC501 ⑧, ⑩, ⑯, ⑰

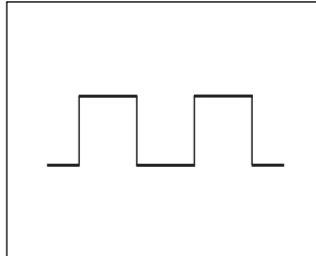
DVD : 3.5 Vp-p (24.57 MHz)
CD : 3.5 Vp-p (22.58 MHz)

③ IC501 ⑫



3.6 Vp-p (27 MHz)

④ IC501 ⑭

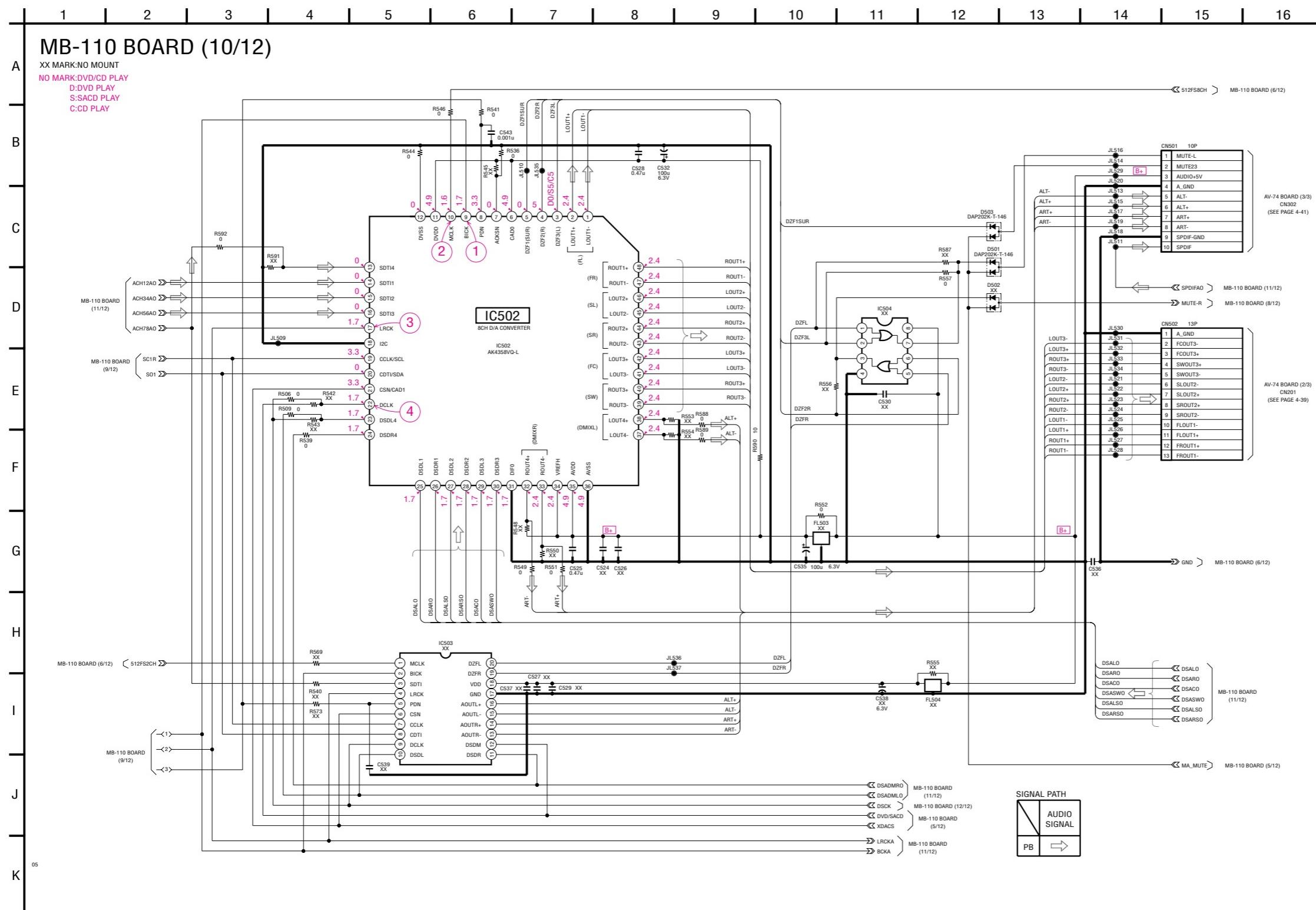
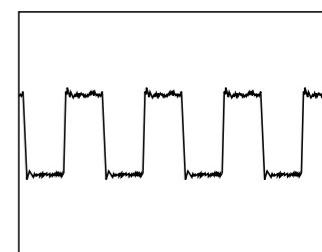
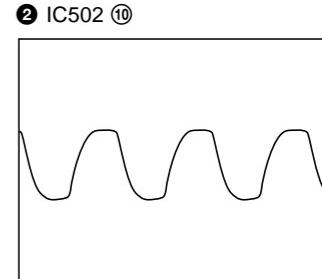
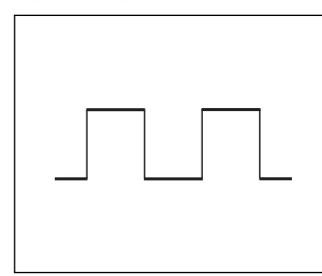
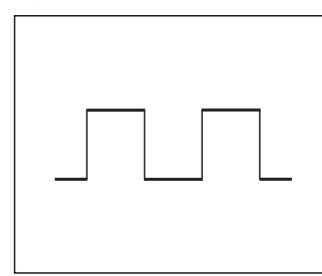
DVD : 3.4 Vp-p (48 kHz)
CD : 3.4 Vp-p (44.1 kHz)

⑤ IC501 ⑯

DVD : 3.4 Vp-p (3.1 MHz)
CD : 3.4 Vp-p (2.8 MHz)

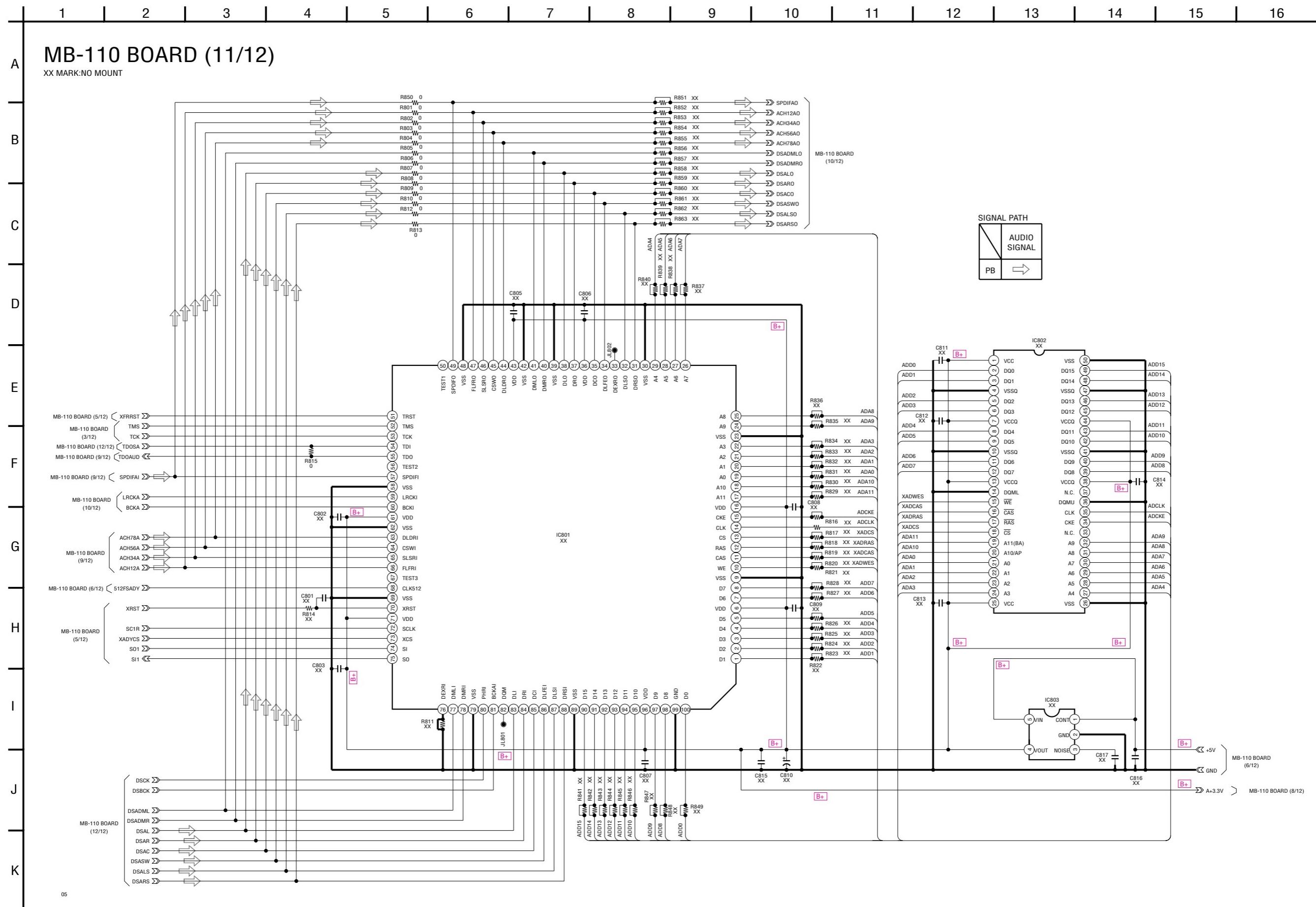
MB-110 (8ch DAC) SCHEMATIC DIAGRAM

- Ref. No.: MB-110 board; 2,000 series -

**• Waveforms****① IC502 ⑨****② IC502 ⑩****③ IC502 ⑯****④ IC502 ㉑**

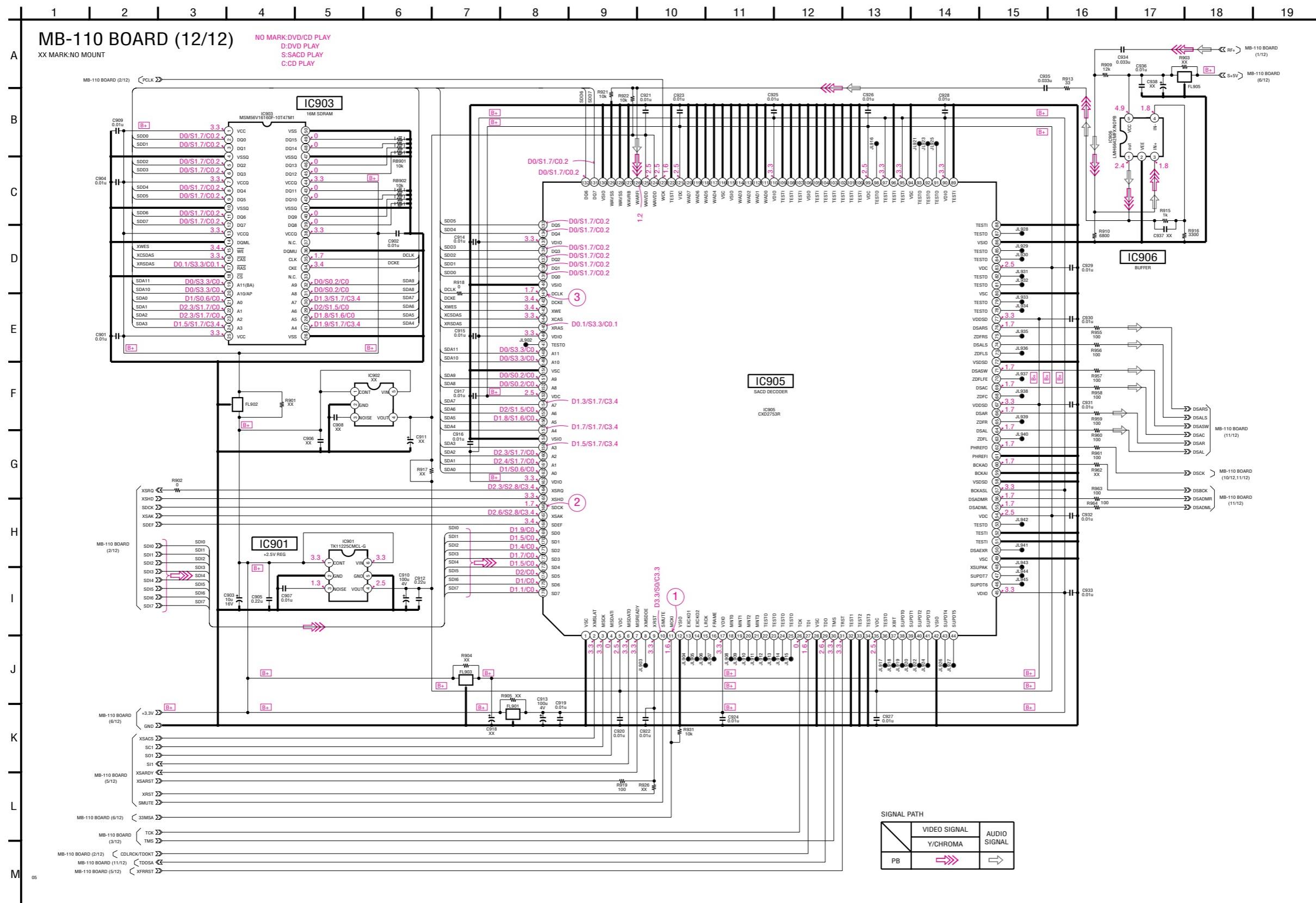
MB-110 (RELAY) SCHEMATIC DIAGRAM

- Ref. No.: MB-110 board; 2,000 series -



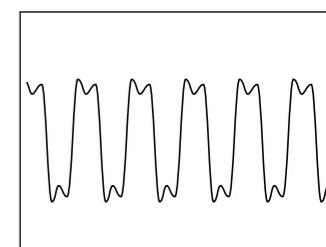
MB-110 (SACD DECODER) SCHEMATIC DIAGRAM

– Ref. No.: MB-110 board; 2,000 series –



- **Waveforms**

① IC905 ⑪



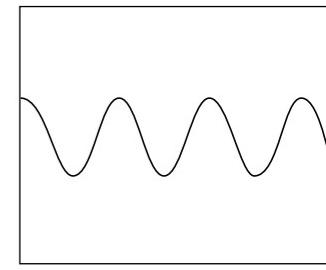
4 Vp-p (33.87 MHz)

② IC905 ⑯



3.4 Vp-p (4.2 MHz)

3 IC905 141



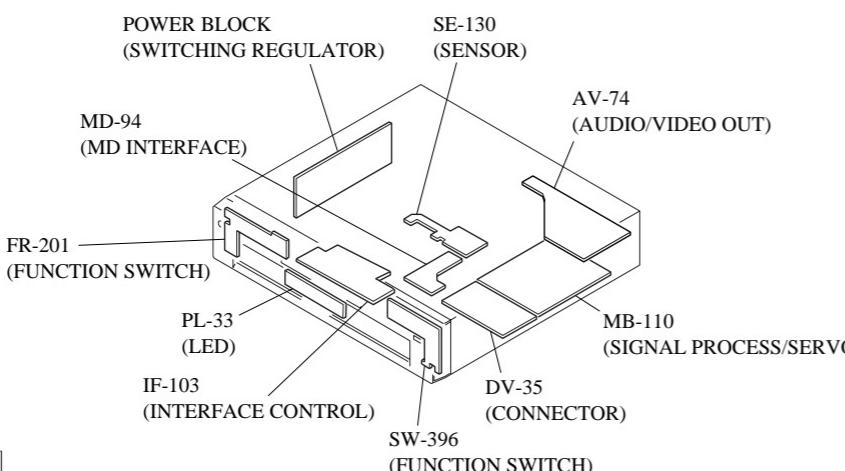
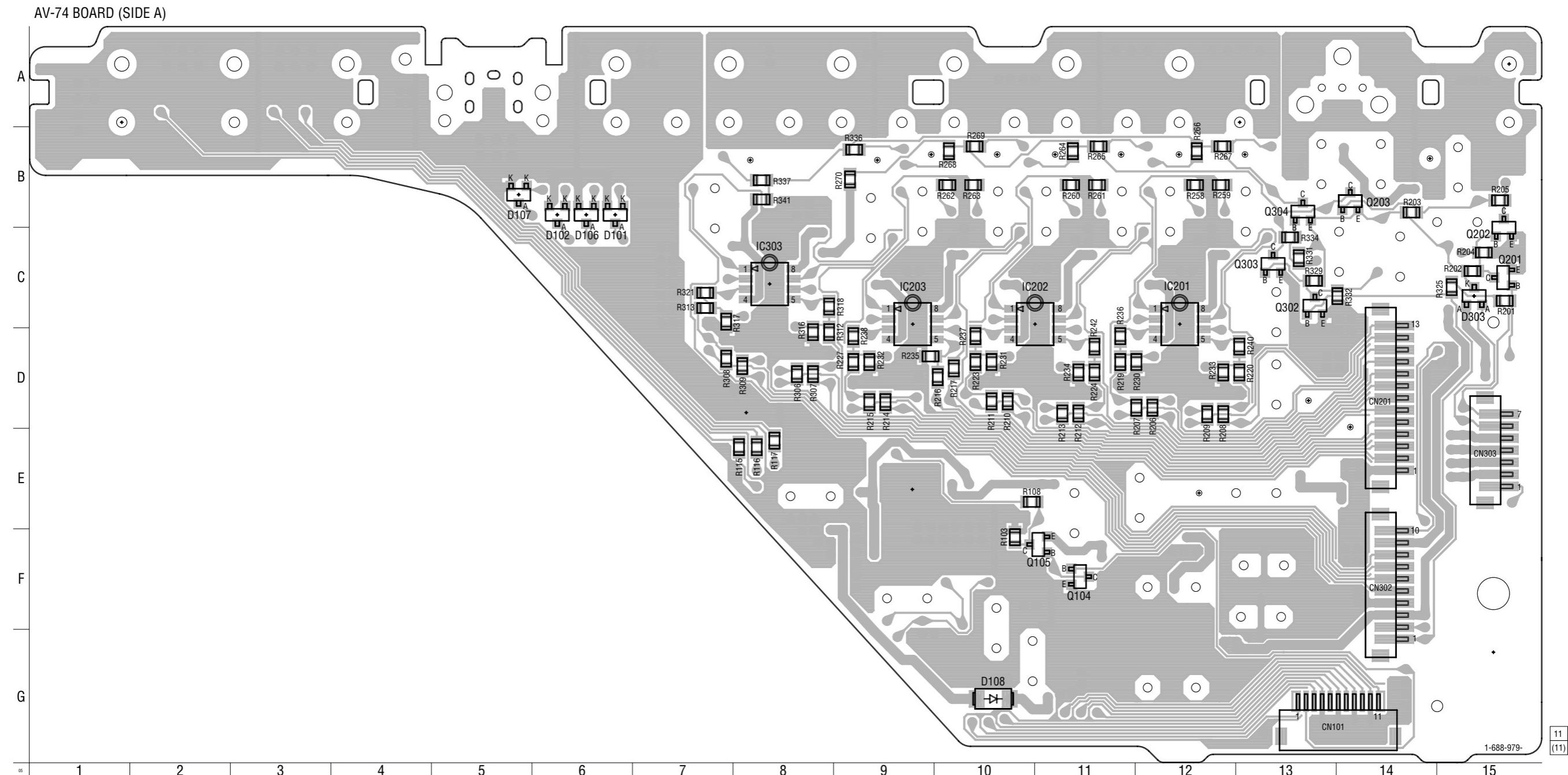
4.6 Vp-p (33.87 MHz)

AV-74 (AUDIO/VIDEO OUT) PRINTED WIRING BOARD

– Ref. No.: AV-74 board; 1,000 series –

LF: Uses unleaded solder.

There are a few cases that the part isn't mounted in this model is printed on this diagram.

**AUDIO/VIDEO OUT
AV-74****AV-74 BOARD (SIDE A)**

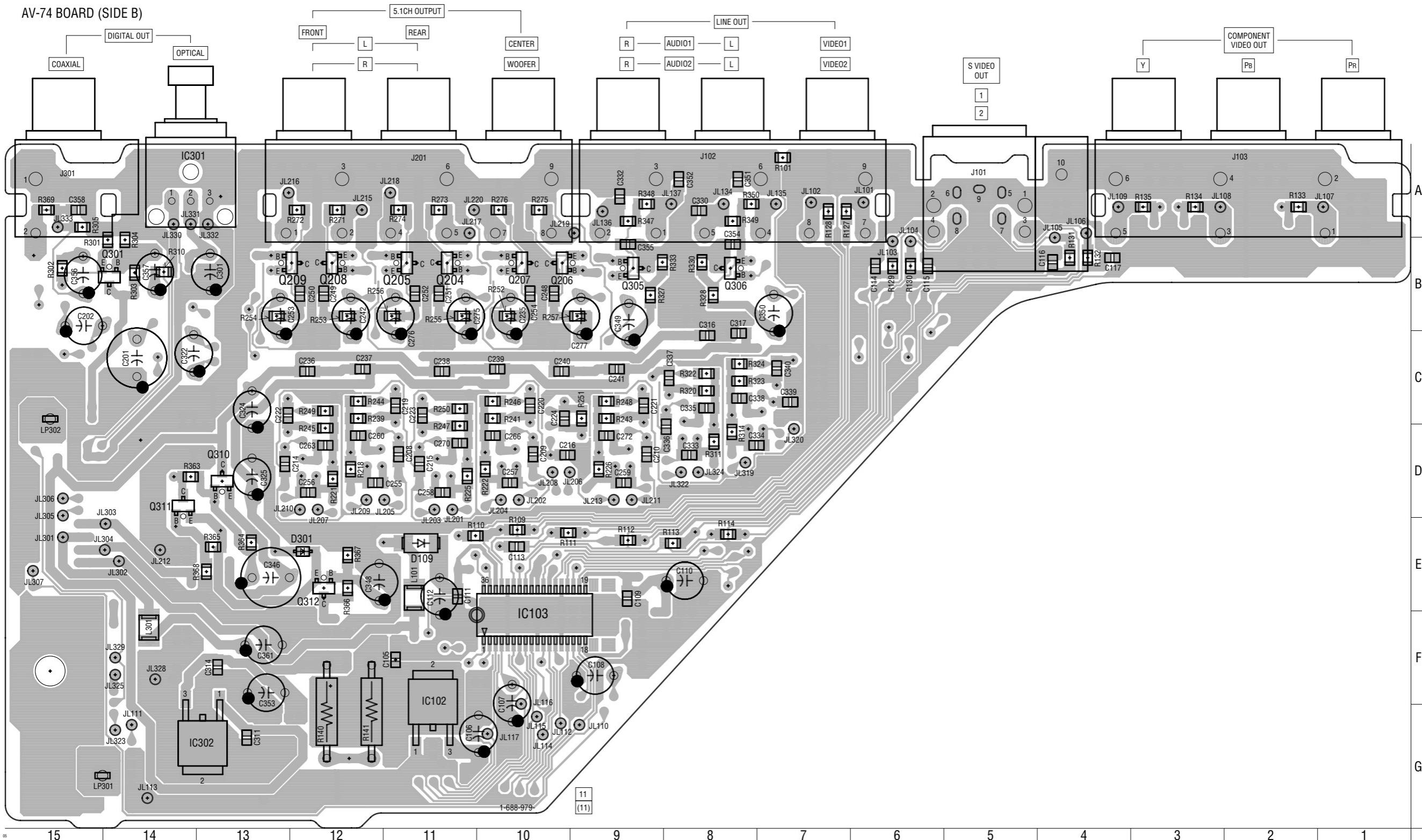
CN101	G-14
CN201	D-14
CN302	F-14
CN303	E-15

D101	B-6
D102	B-6
D106	B-6
D107	B-5
D108	G-10
D303	C-15

IC201	C-12
IC202	C-11
IC203	C-9
IC303	C-8

Q104	F-11
Q105	F-11
Q201	C-15
Q202	B-15
Q203	B-14
Q302	C-13
Q303	C-13
Q304	B-13

AV-74 BOARD (SIDE B)



AV-74 BOARD (SIDE B)

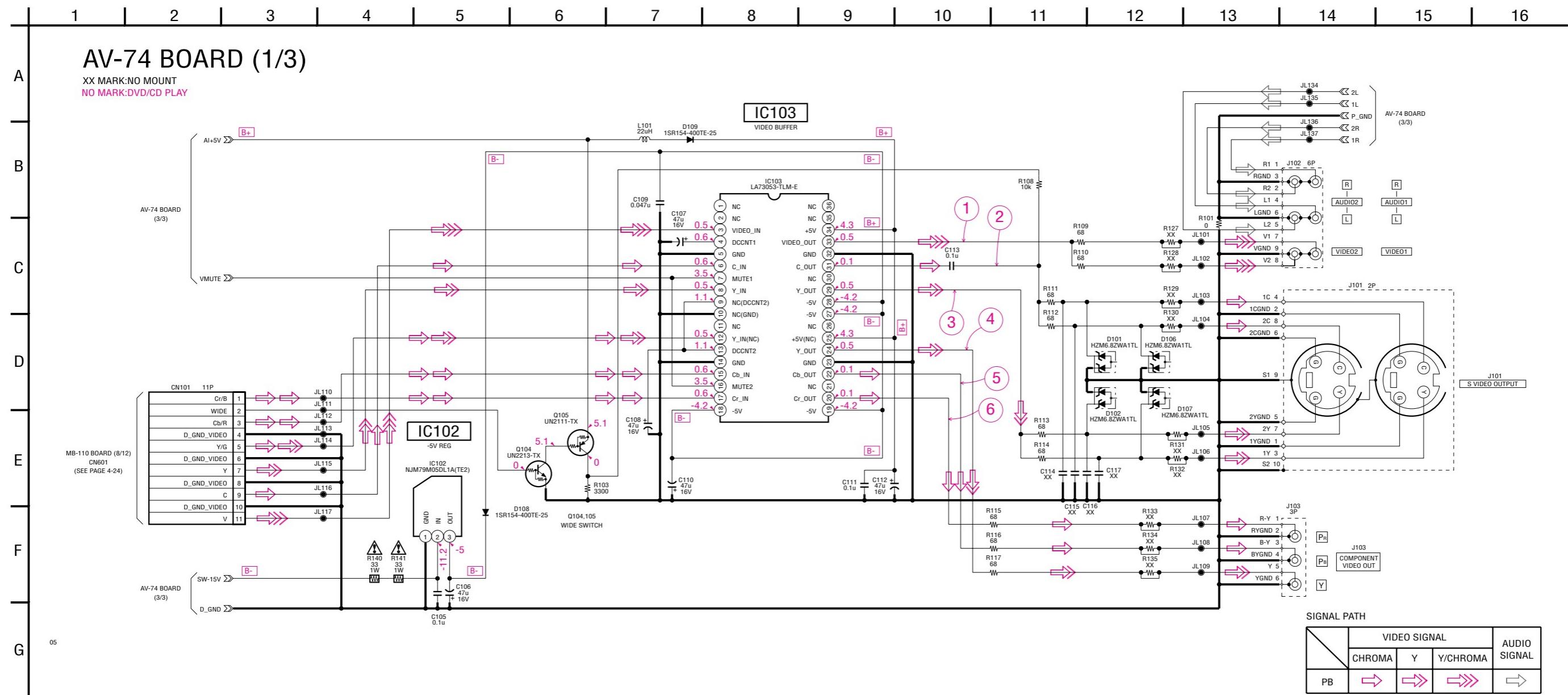
D109	E-11
D301	E-12

IC102	F-11
IC103	F-10
IC301	A-14
IC302	G-13

Q204	B-11
Q205	B-11
Q206	B-10
Q207	B-10
Q208	B-12
Q209	B-13
Q301	B-14
Q305	B-9
Q306	B-8
Q310	D-13
Q311	D-14
Q312	E-12

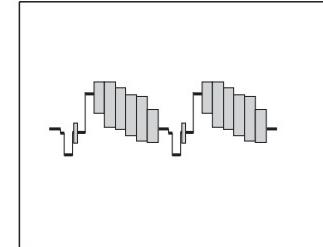
AV-74 (VIDEO BUFFER) SCHEMATIC DIAGRAM • See page 4-33 for printed wiring board

– Ref. No.: AV-74 board; 1,000 series –

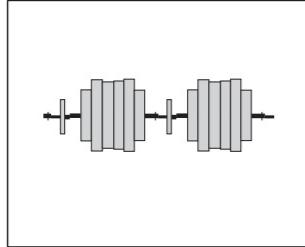


- **Waveforms**

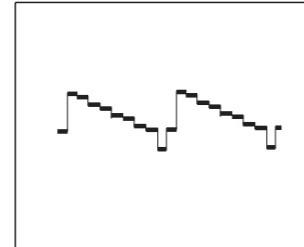
- ① IC103 ③



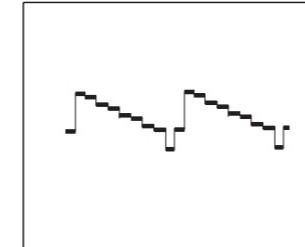
2.4 Vp-p (H)



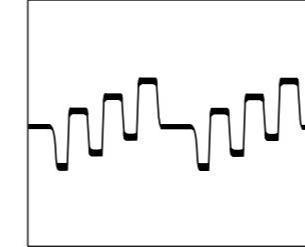
1.8 Vp-p (H)



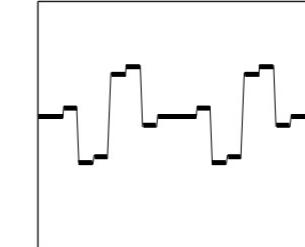
2.0 Vp-p (I)



2.0 Vp-p (H)



1.3 Vp-p (1)

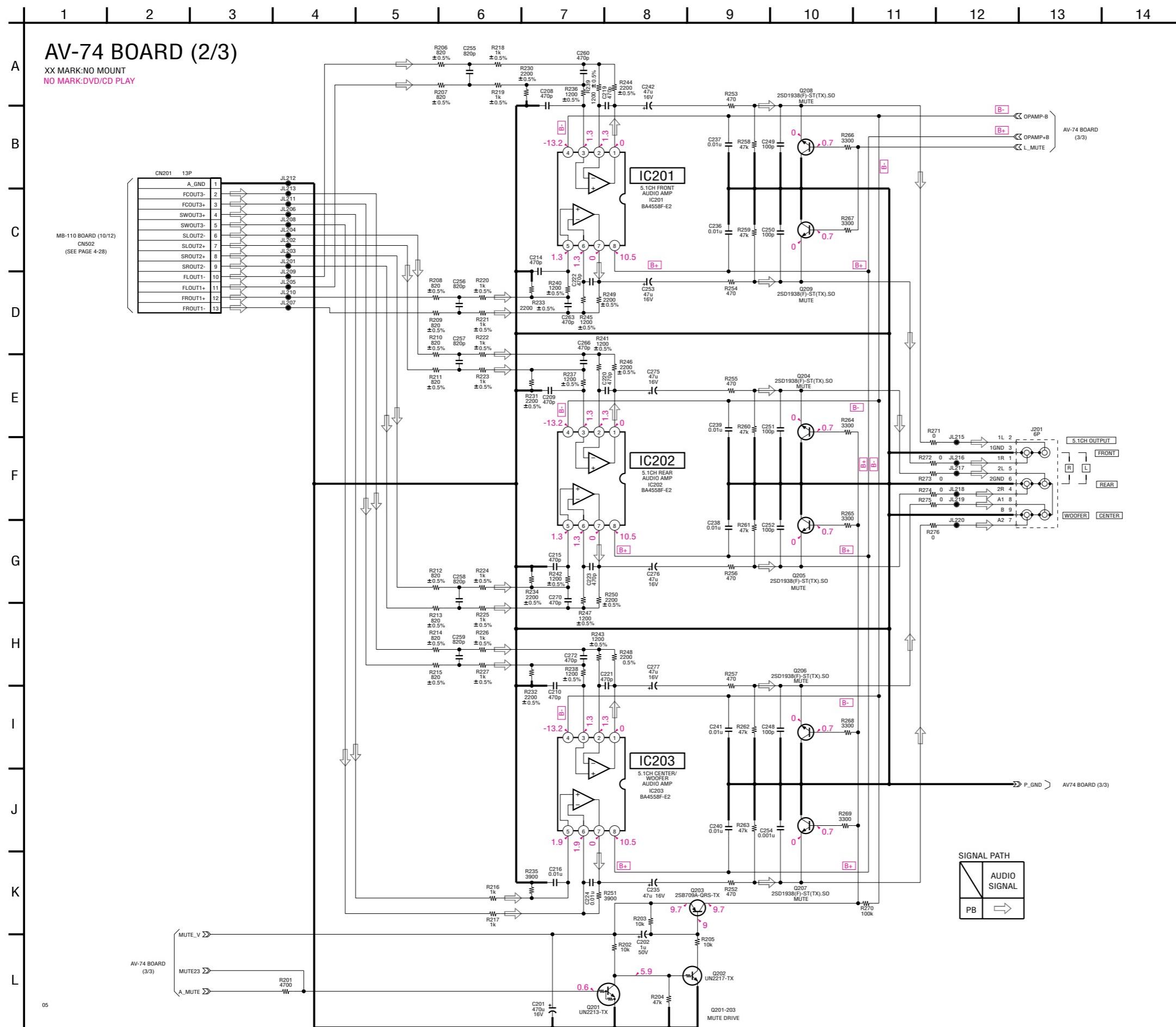


1.3 Vp-p

The components identified by mark or dotted line with mark are critical for safety.
Replace only with part number specified.

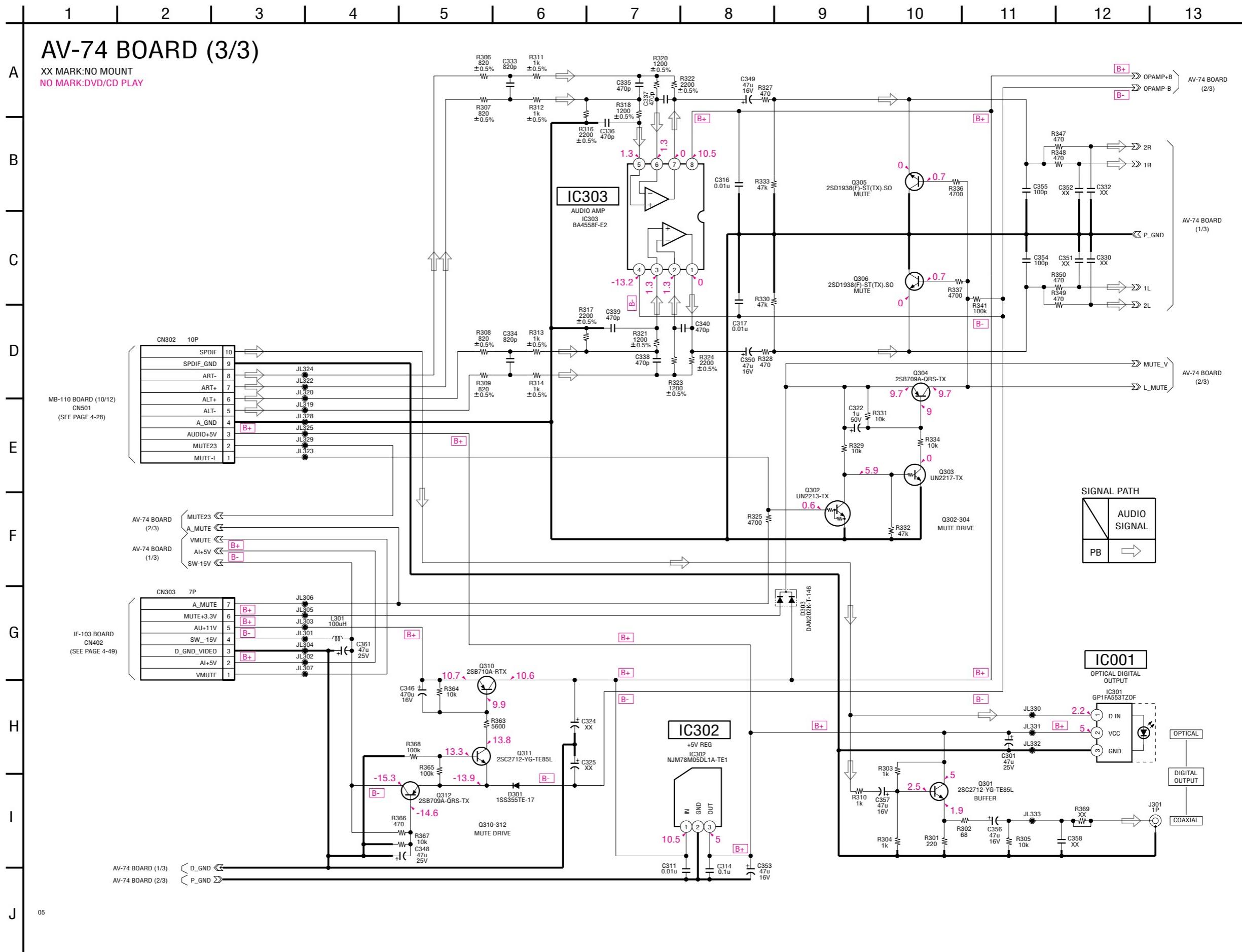
AV-74 (5.1CH AUDIO AMP) SCHEMATIC DIAGRAM • See page 4-33 for printed wiring board.

- Ref. No.: AV-74 board; 1,000 series -



AV-74 (AUDIO AMP) SCHEMATIC DIAGRAM • See page 4-33 for printed wiring board

— Ref. No.: AV-74 board; 1,000 series —



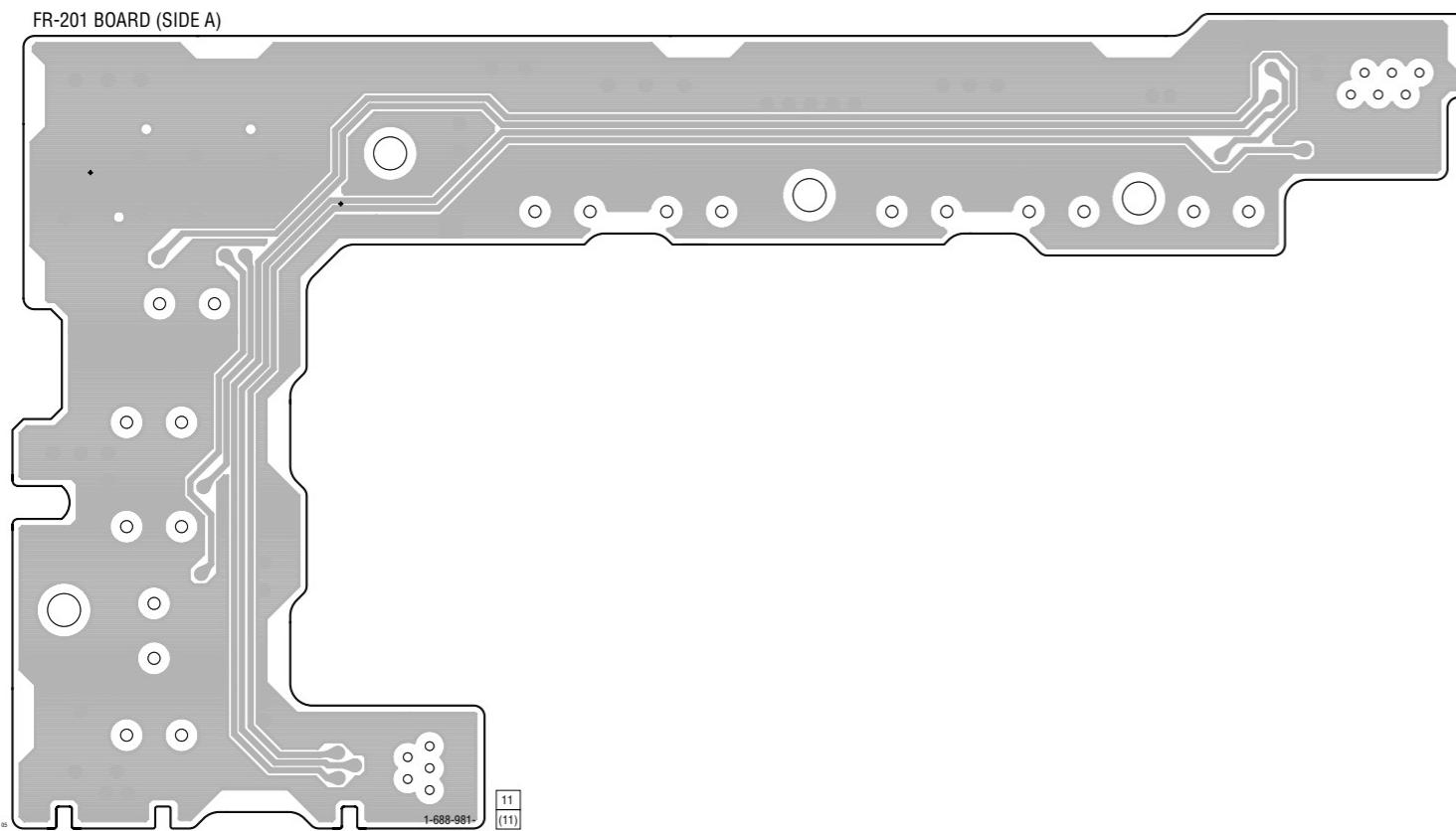
FR-201 (FUNCTION SWITCH) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

- Ref. No.: FR-201 board; 1,000 series -

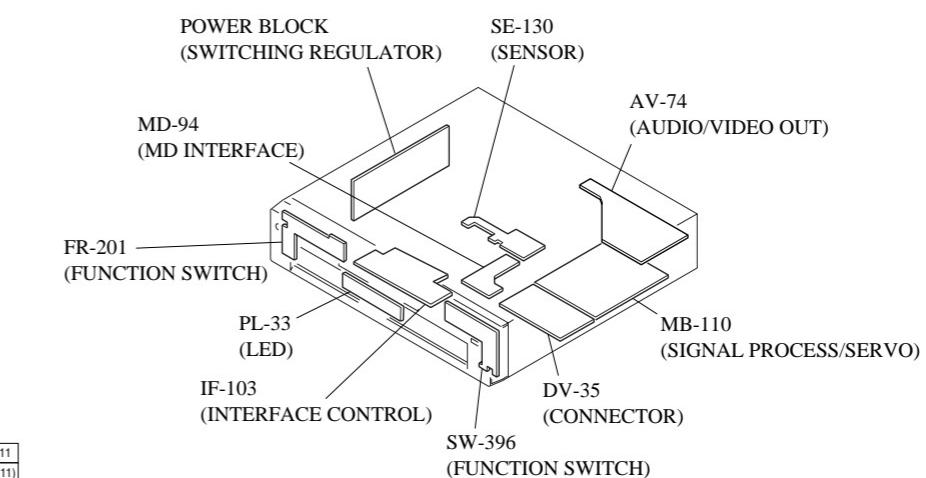
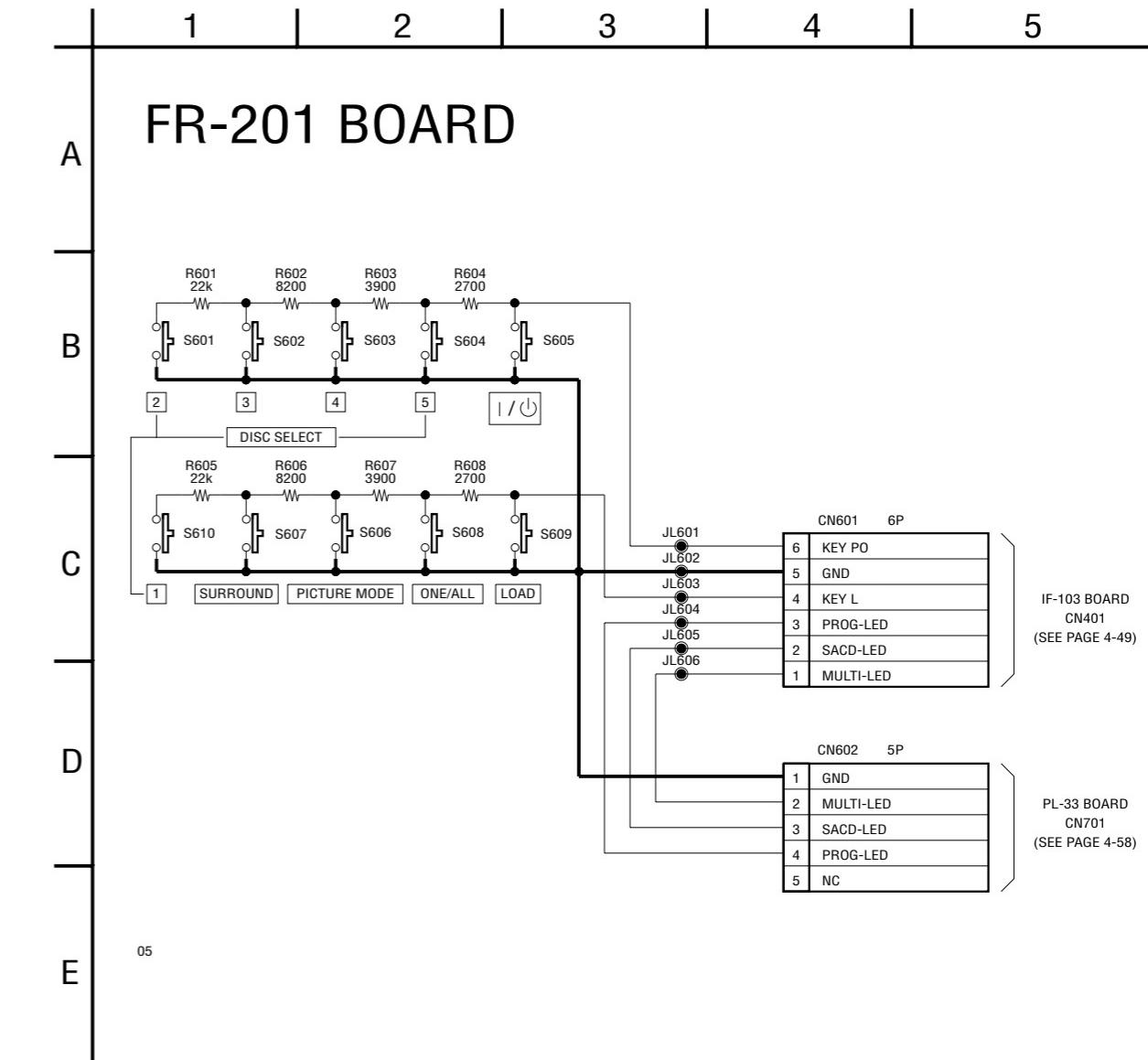
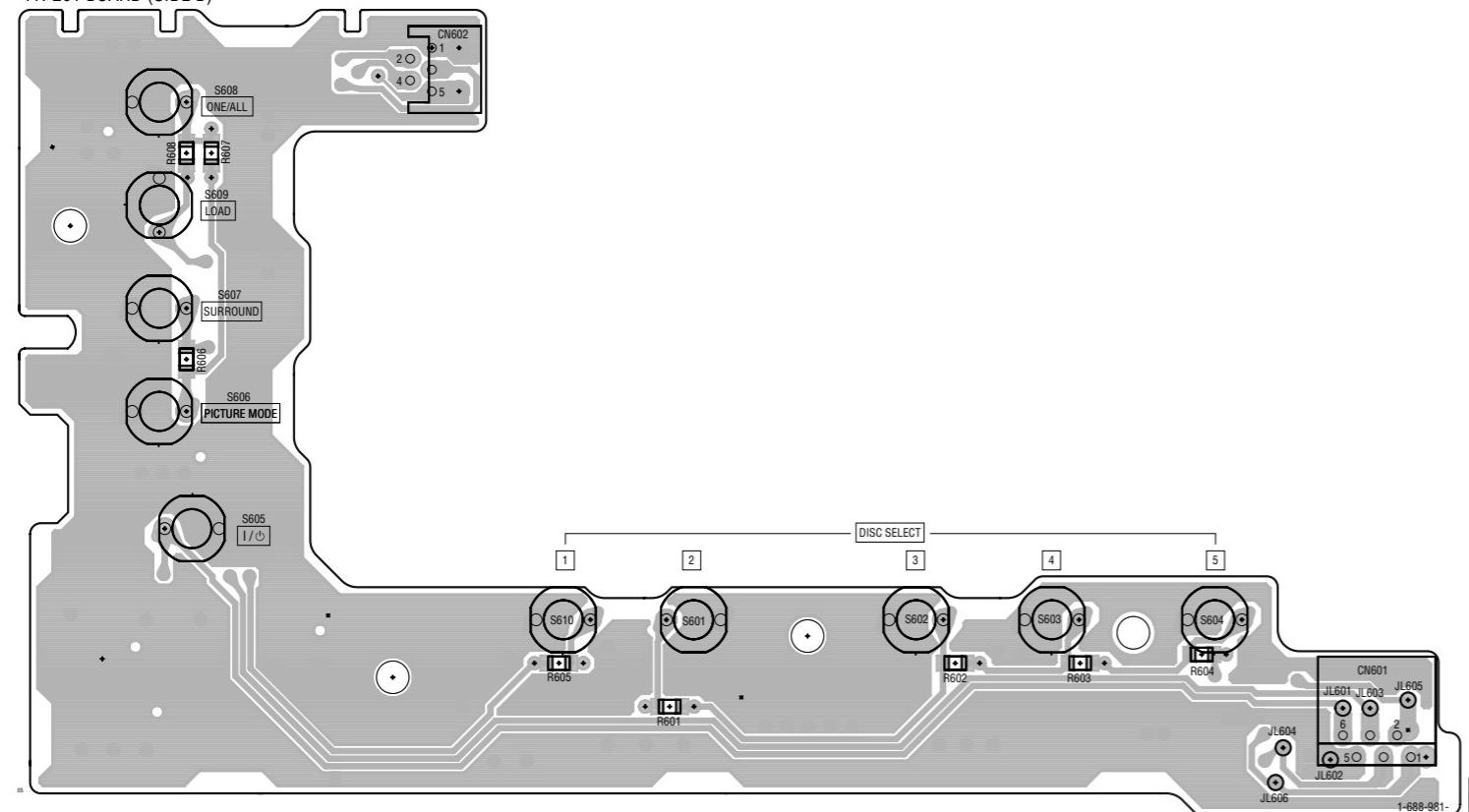
H: Uses unleaded solder.

There are a few cases that the part isn't mounted in this model is printed on this diagram.

FR-201 BOARD (SIDE A)



FR-201 BOARD (SIDE B)

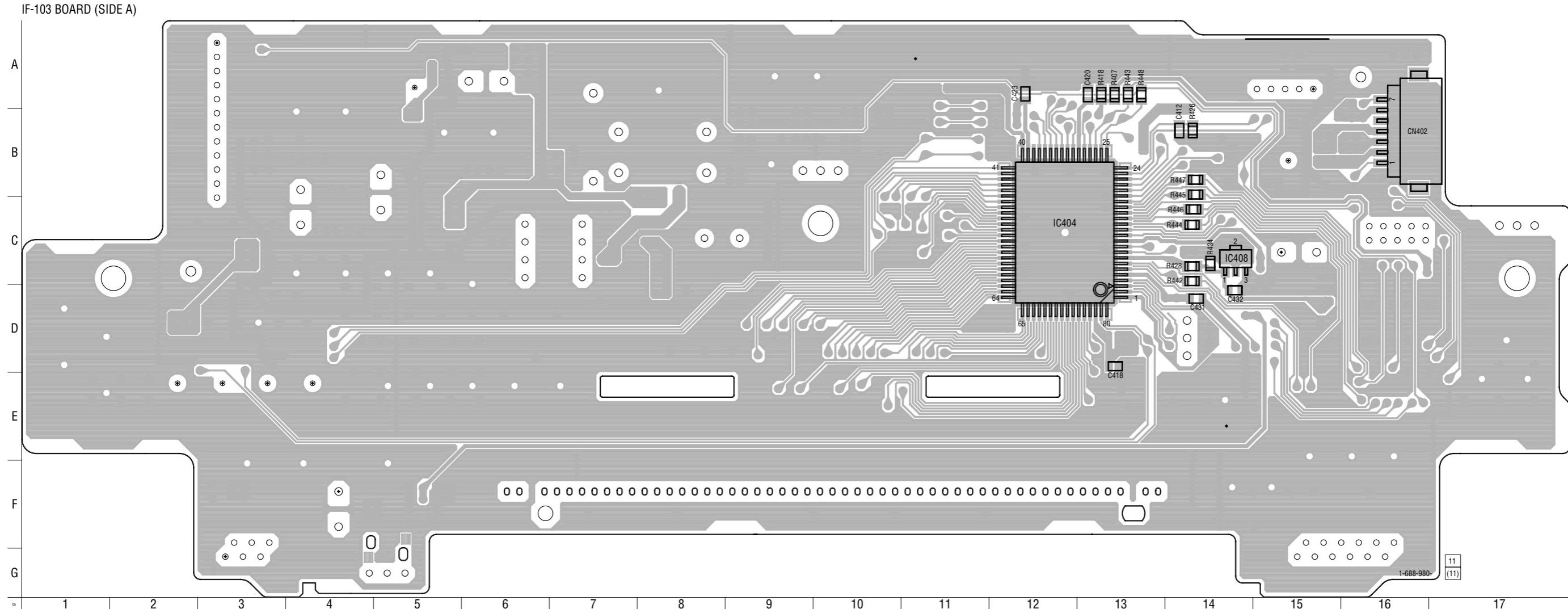


IF-103 (INTERFACE CONTROL) PRINTED WIRING BOARD

– Ref. No.: IF-103 board; 1,000 series –

 : Uses unleaded solder.

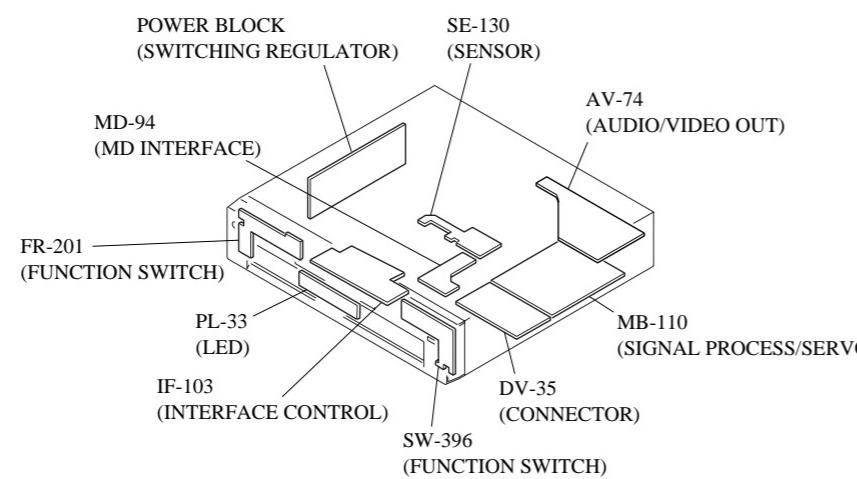
There are a few cases that the part isn't mounted in this model is printed on this diagram.



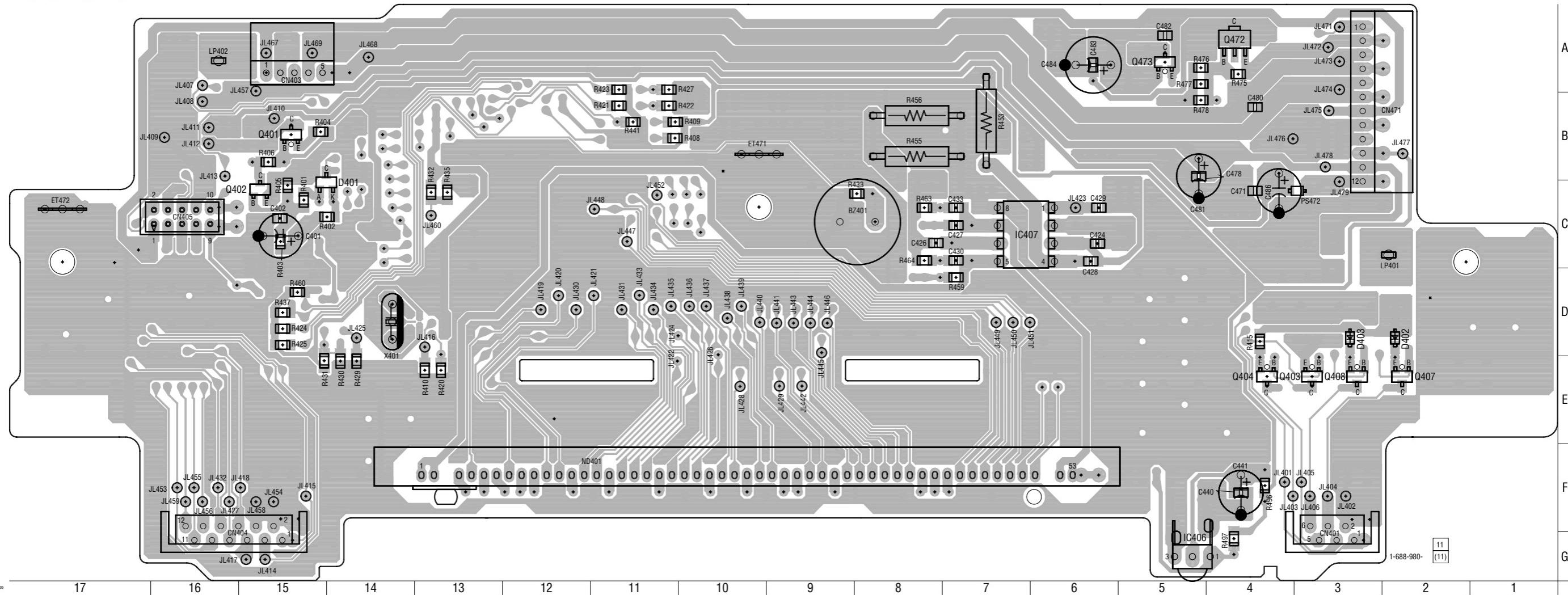
IF-103 BOARD (SIDE A)

CN402 B-

IC404 C-
IC422 C-



IF-103 BOARD (SIDE B)



IF-103 BOARD (SIDE B)

CN401	G-3
CN403	A-15
CN404	G-16
CN405	C-16
CN471	B-2

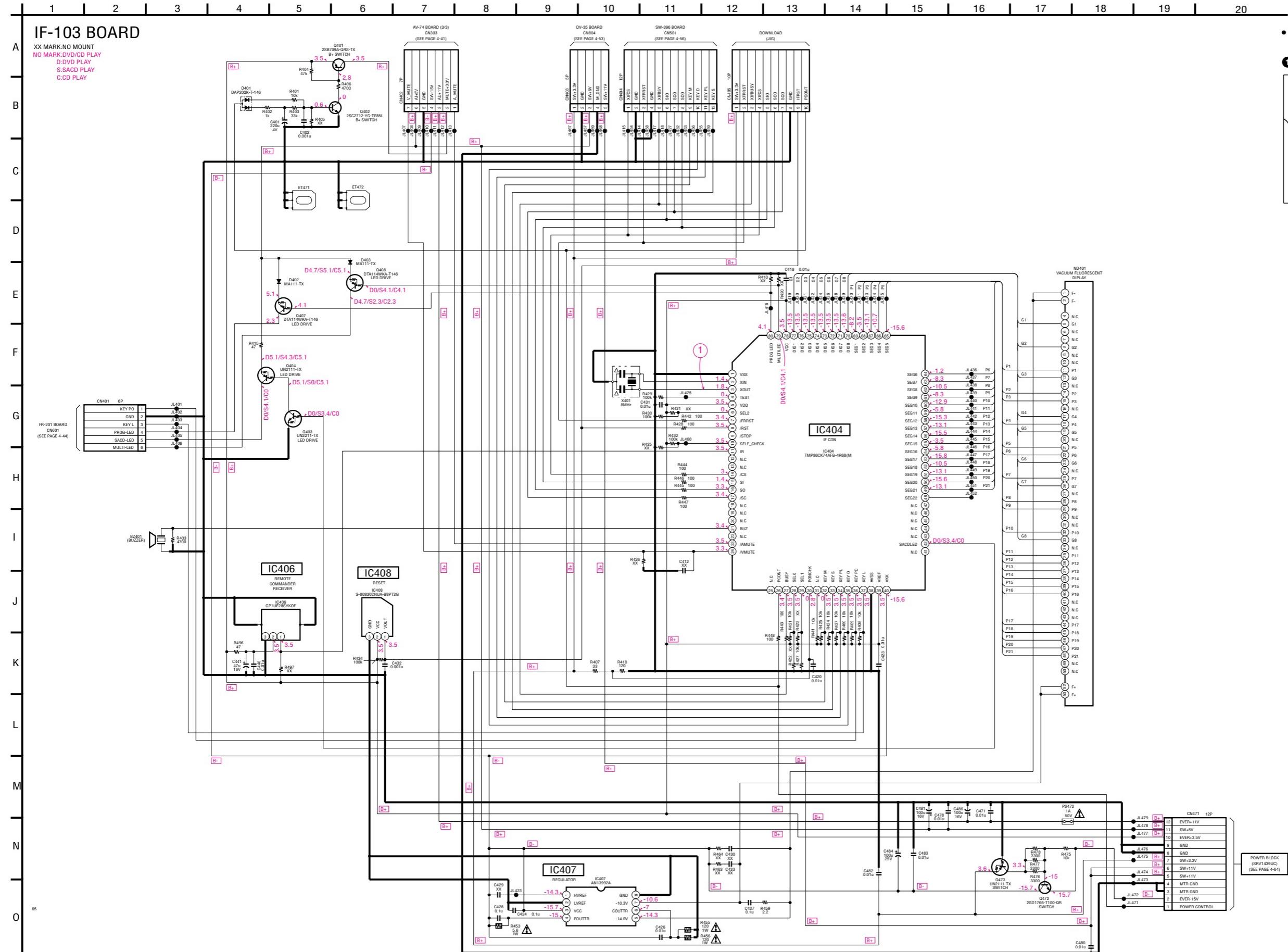
D401	C-14
D402	D-2
D403	D-3

IC406	G-5
IC407	C-7

Q401	B-15
Q402	C-15
Q403	E-3
Q404	E-4
Q407	E-2
Q408	E-3
Q472	A-4
Q473	A-5

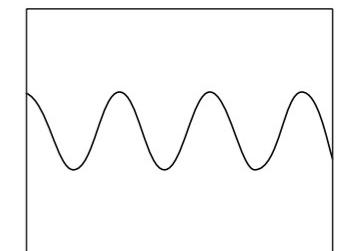
IF-103 (IF CON) SCHEMATIC DIAGRAM

- Ref. No.: IF-103 board; 1,000 series -



• Waveforms

① IC404 ③



3.4 Vp-p (8 MHz)

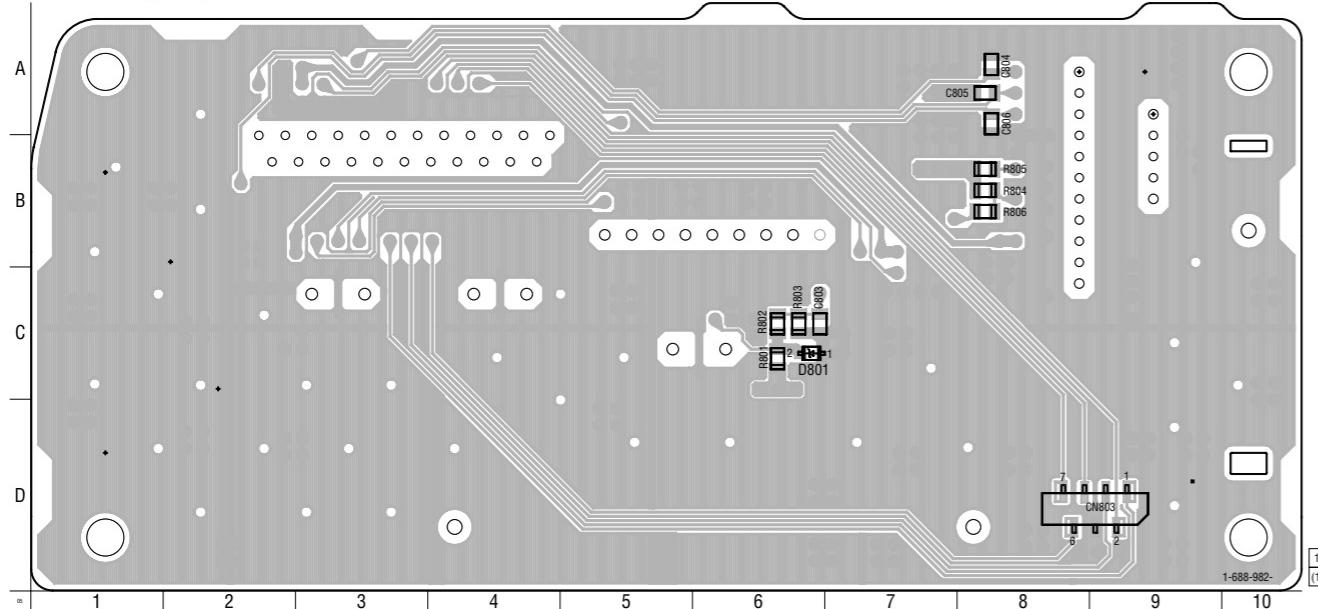
DV-35 (CONNECTOR) PRINTED WIRING BOARD

– Ref. No.: DV-35 board; 1,000 series –

 : Uses unleaded solder

There are a few cases that the part isn't mounted in this model is printed on this diagram

DV-35 BOARD (SIDE A)

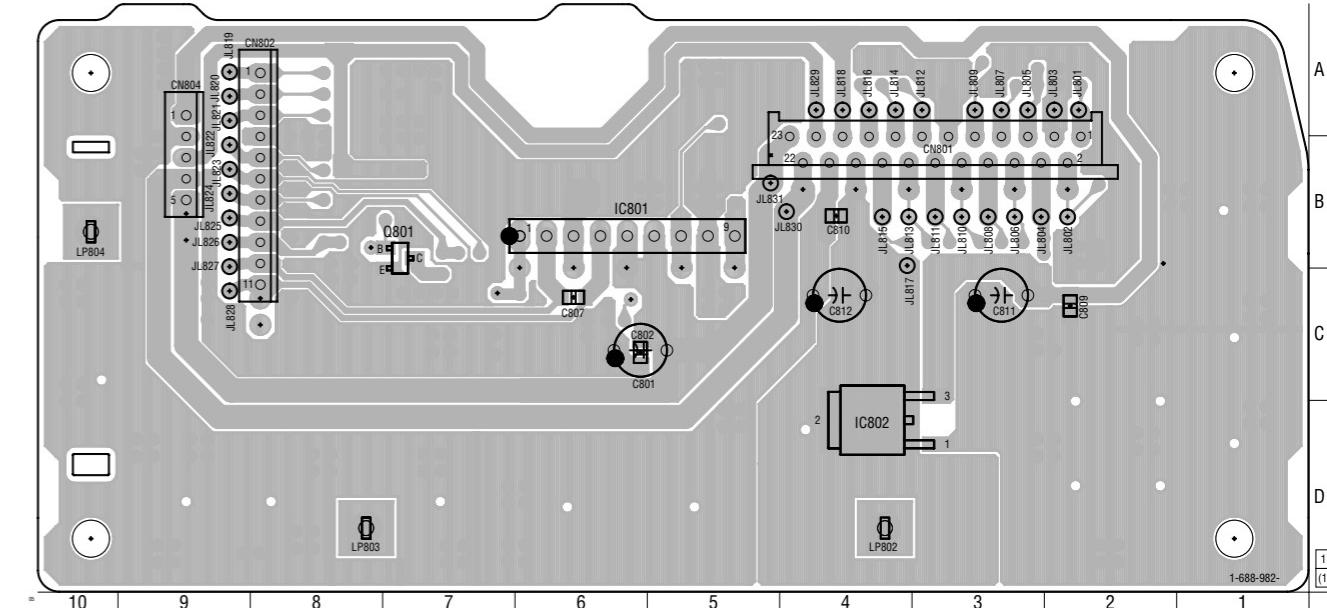


DV-35 BOARD (SIDE A)

CN803 D-9

D801 C-6

DV-35 BOARD (SIDE B)

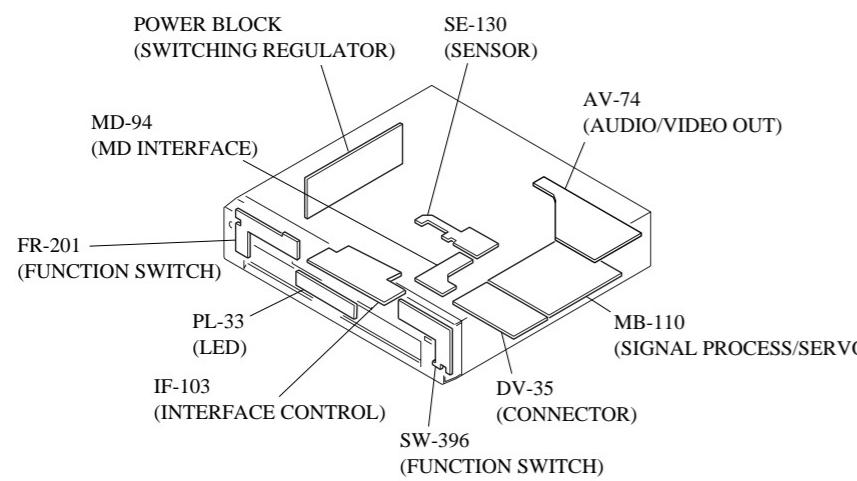


DV-35 BOARD (SIDE B)

CN801 B-3
CN802 B-8
CN804 B-9

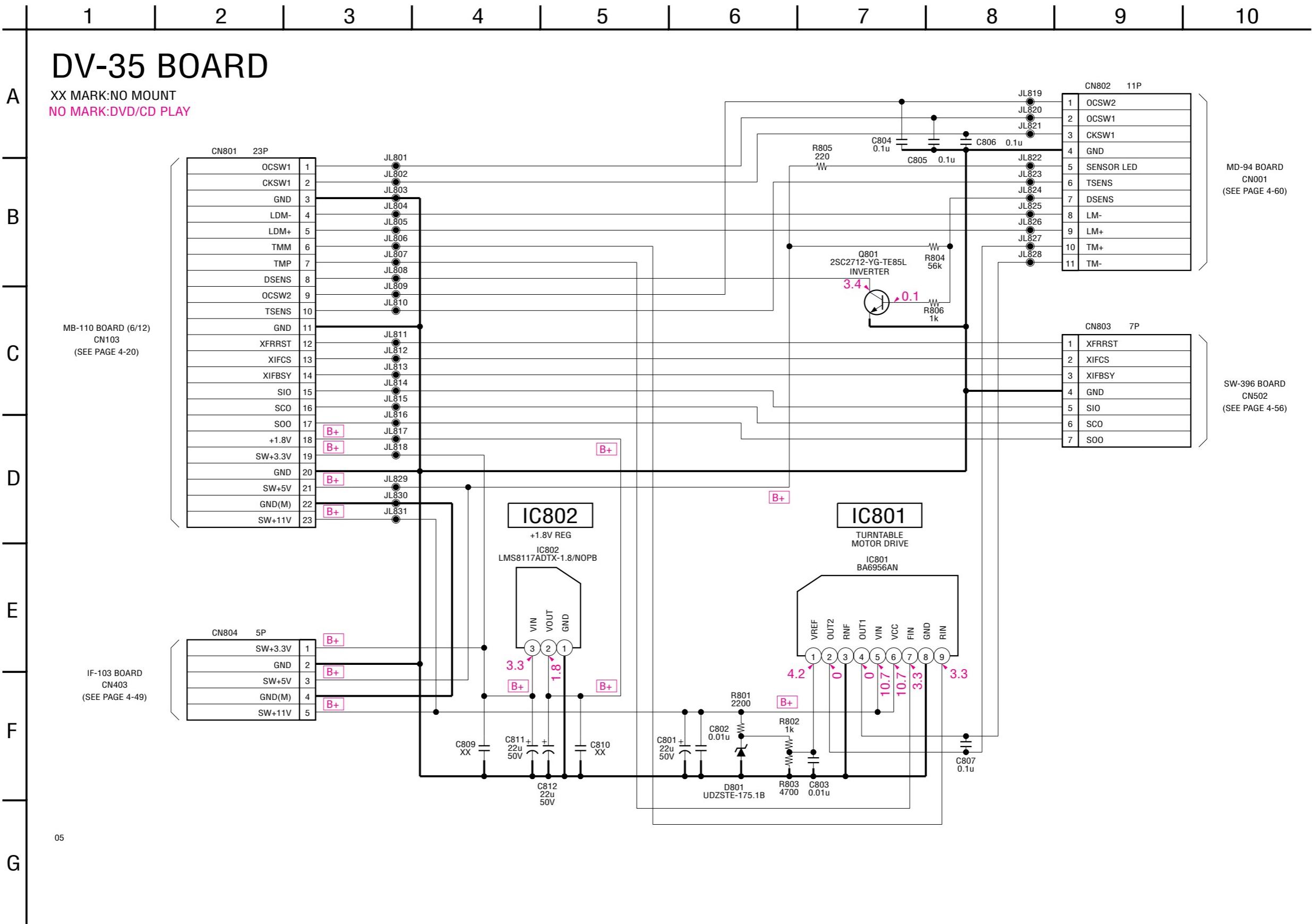
IC801 B-6
IC802 D-4

Q801 B-7



DV-35 (CONNECTOR) SCHEMATIC DIAGRAM

- Ref. No.: DV-35 board; 1,000 series -

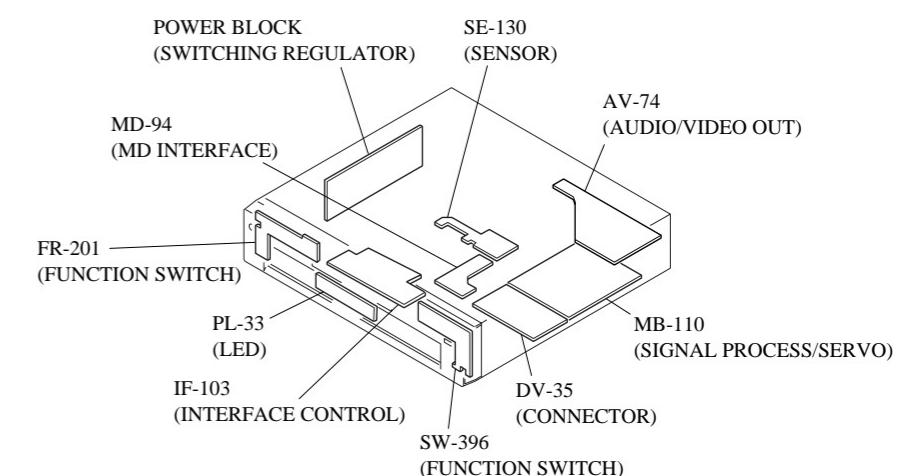
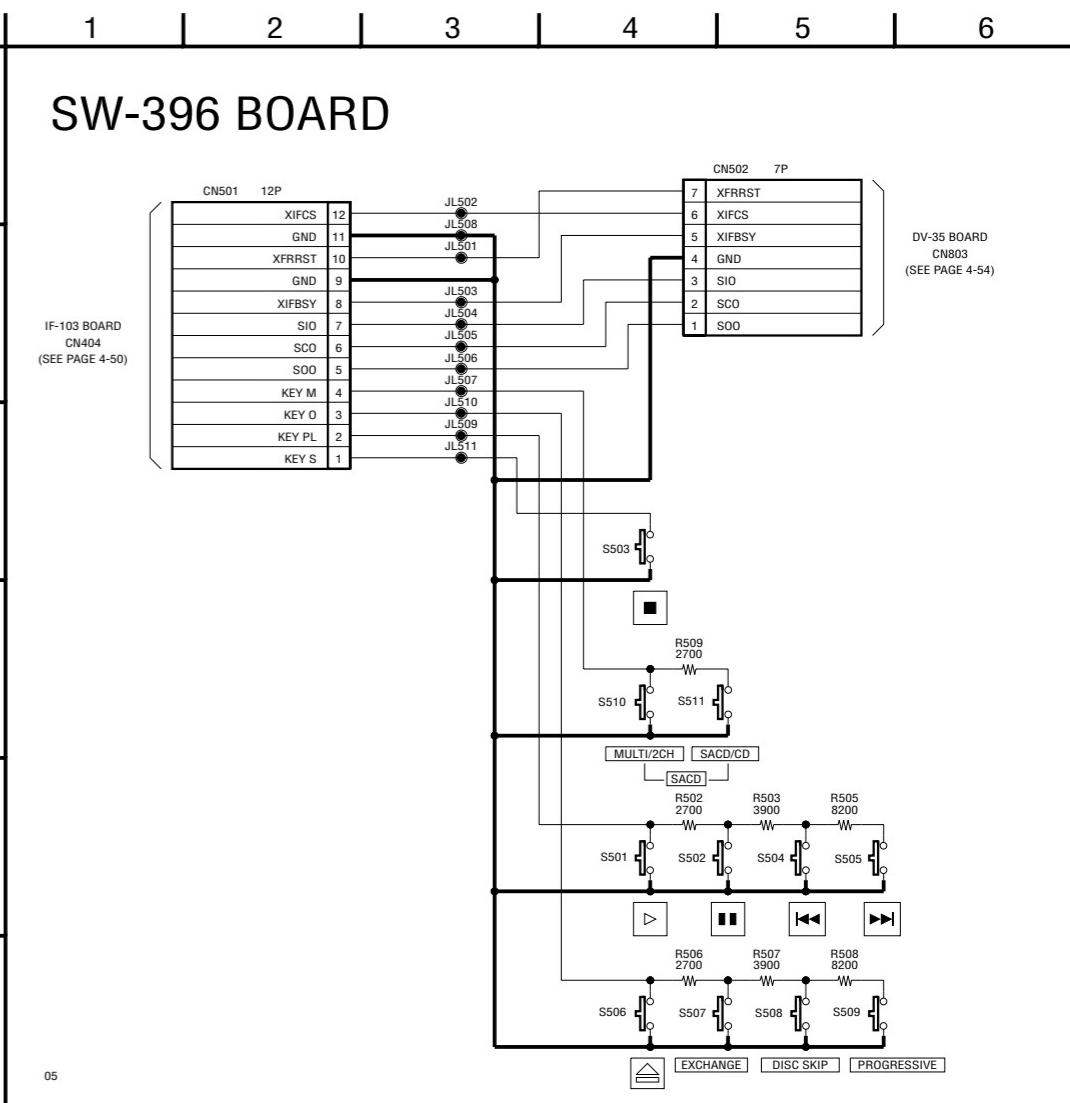
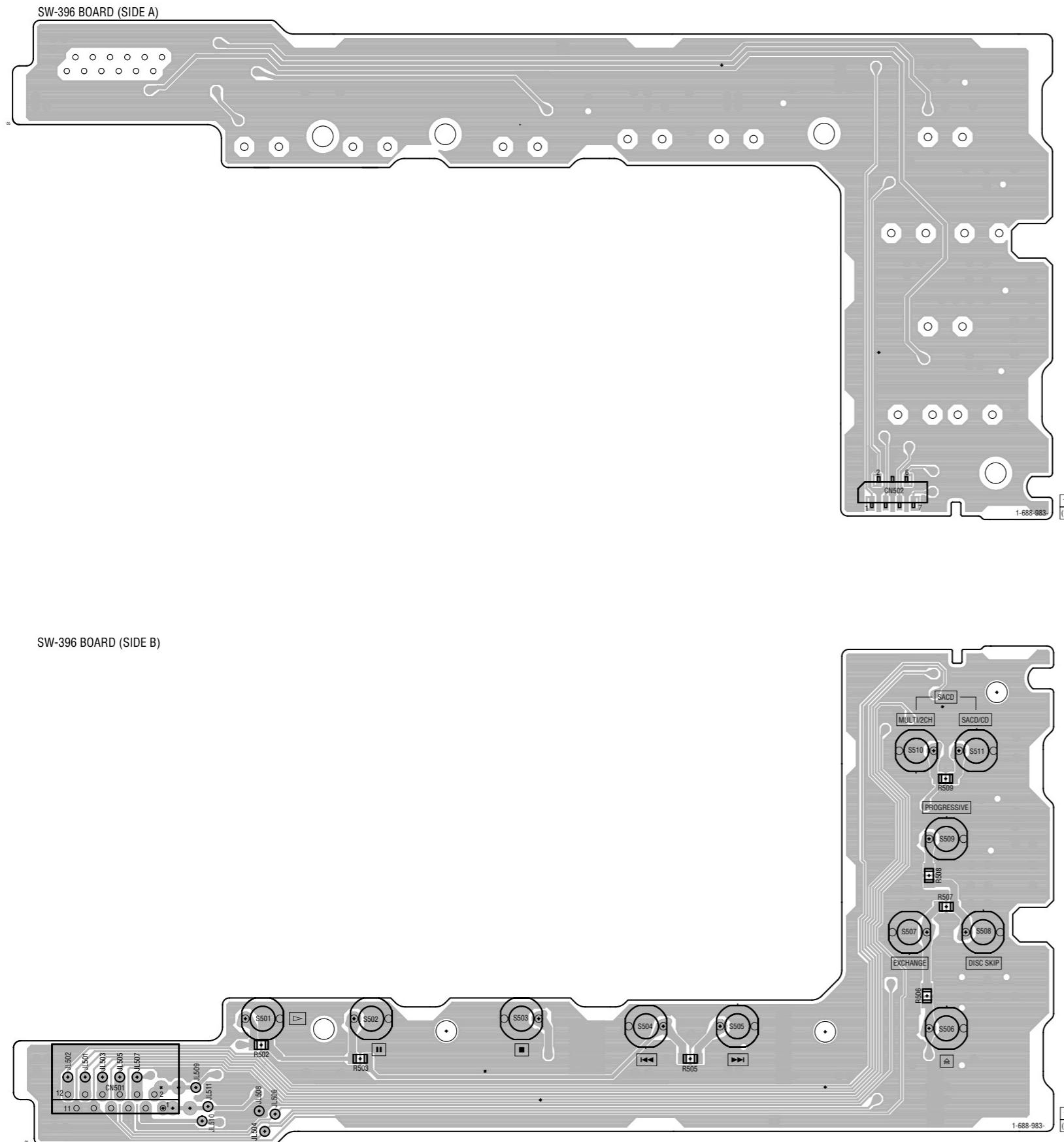


SW-396 (FUNCTION SWITCH) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

- Ref. No.: SW-396 board; 1,000 series -

H: Uses unleaded solder.

There are a few cases that the part isn't mounted in this model is printed on this diagram.



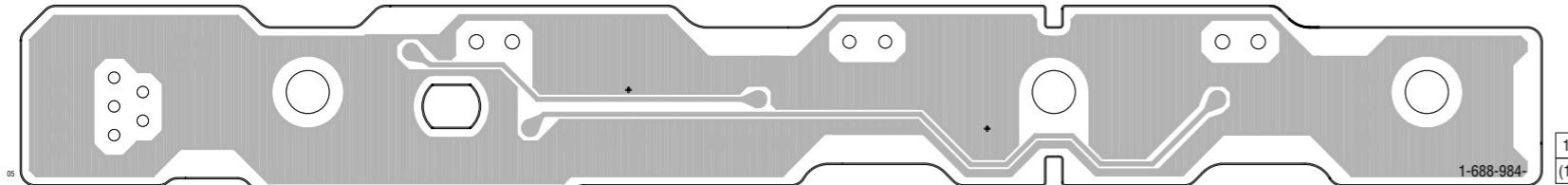
PL-33 (LED) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

- Ref. No.: PL-33 board; 1,000 series -

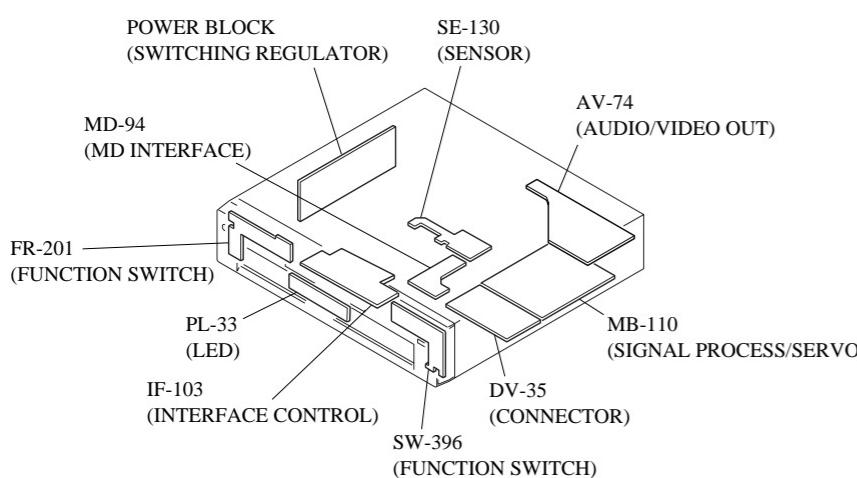
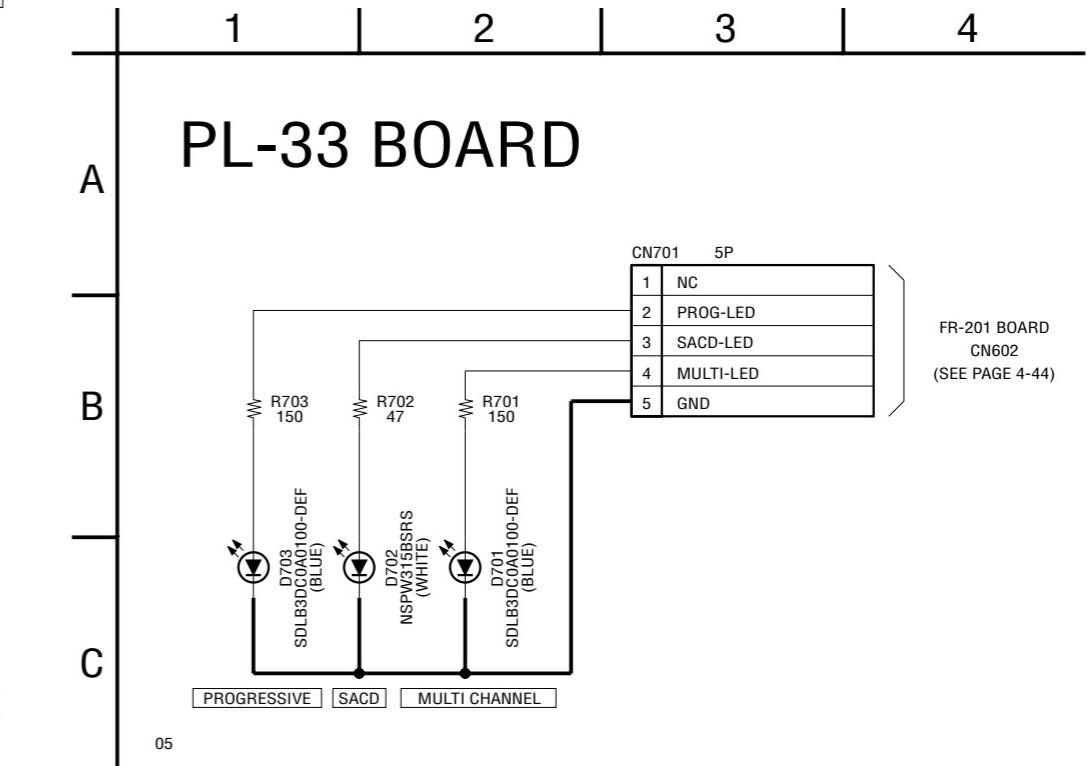
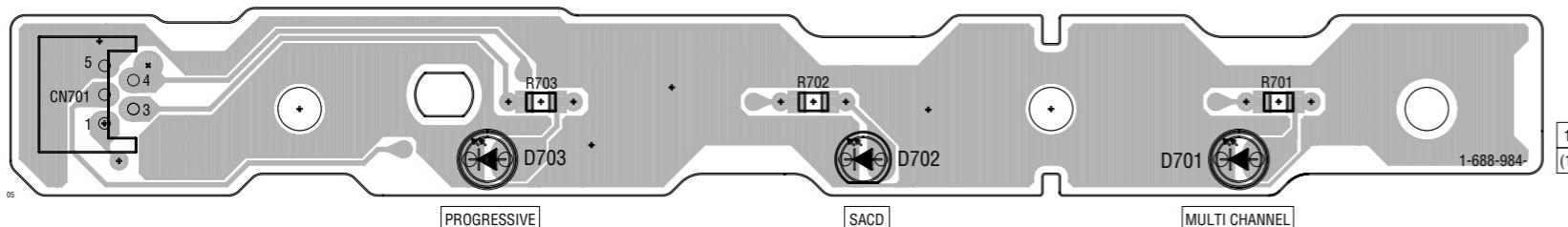
U: Uses unleaded solder.

There are a few cases that the part isn't mounted in this model is printed on this diagram.

PL-33 BOARD (SIDE A)



PL-33 BOARD (SIDE B)

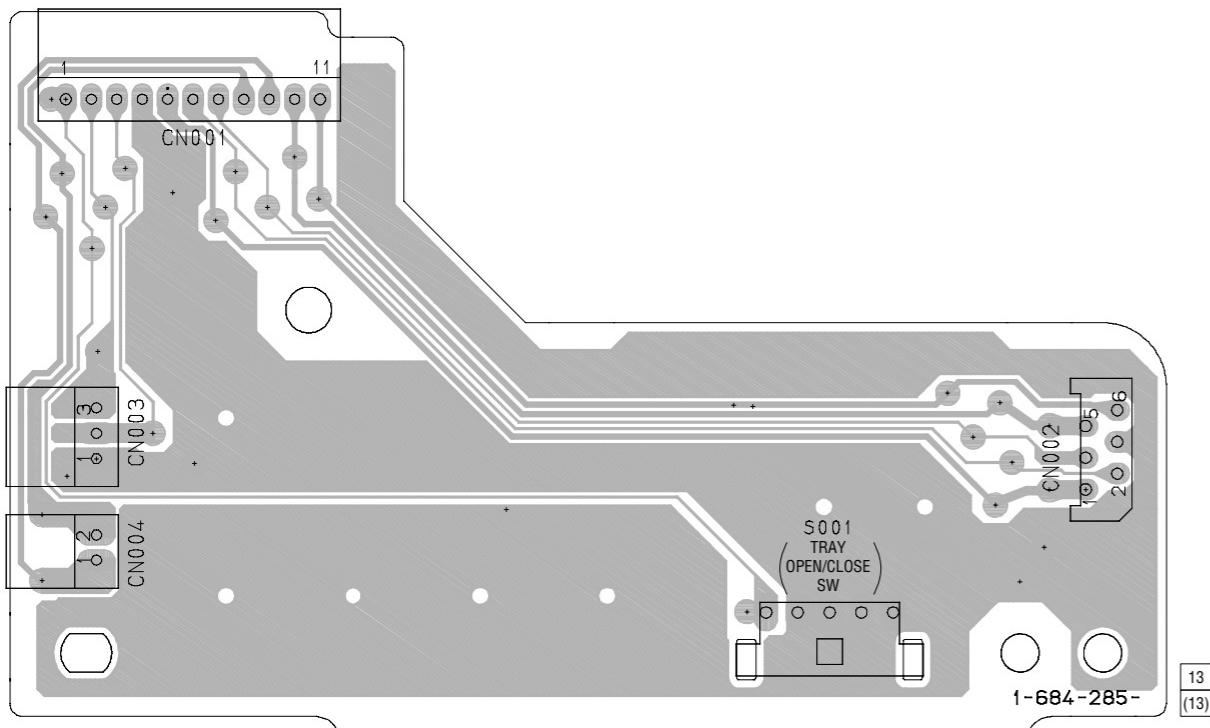
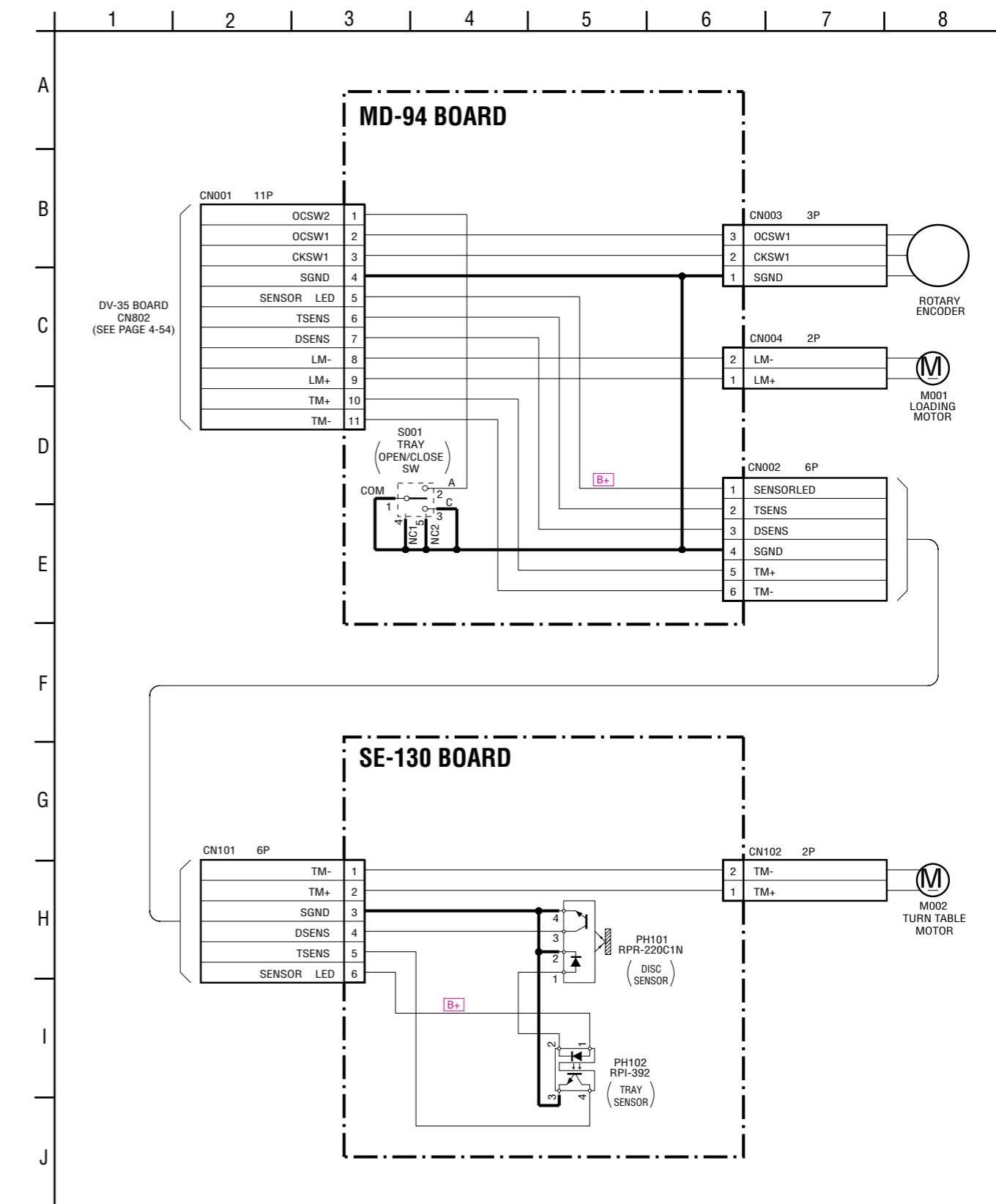
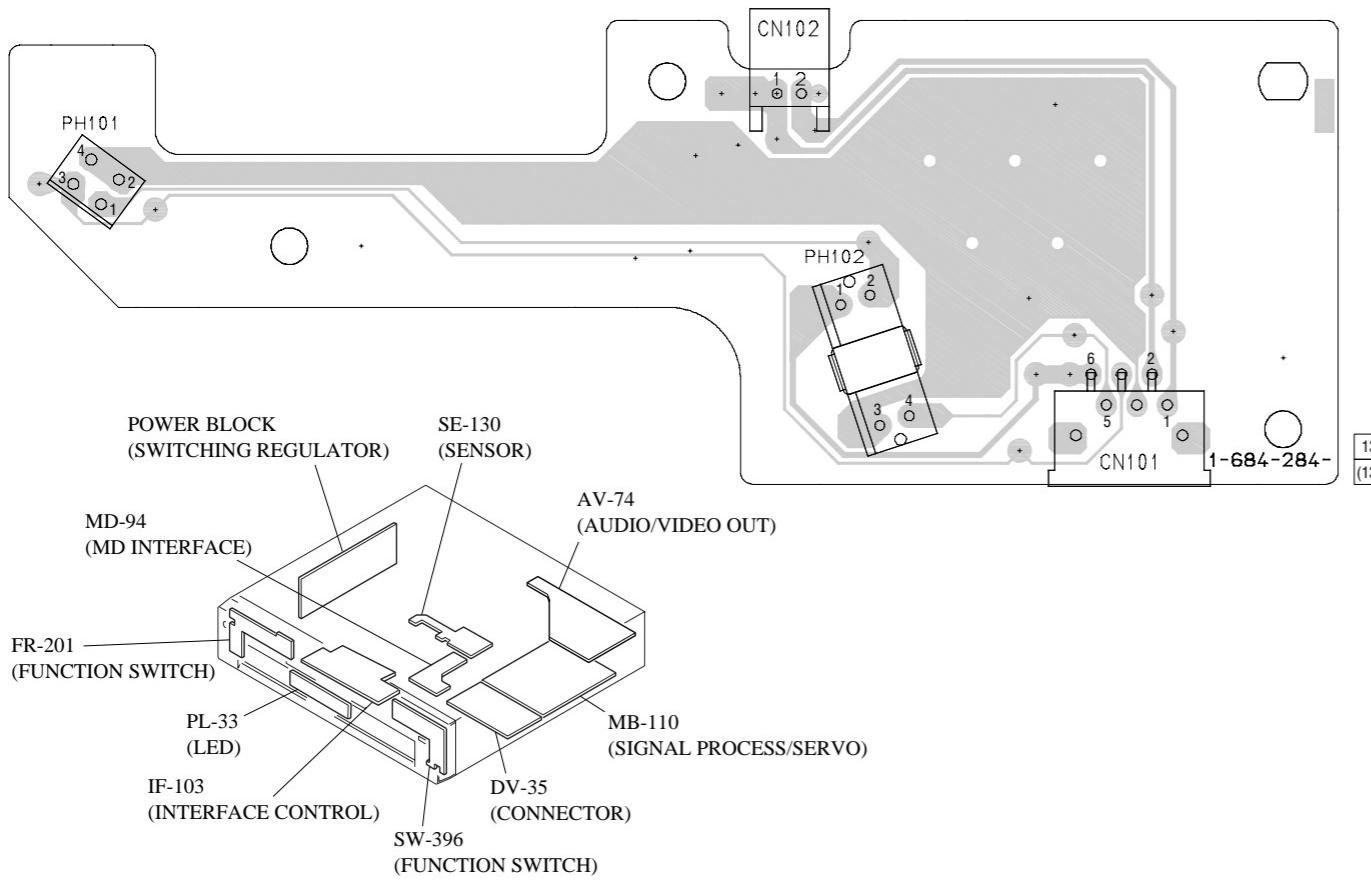


MD-94 (MD INTERFACE), SE-130 (SENSOR) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

- Ref. No.: MD-94 board; 1,000 series, SE-130 board; 3,000 series -

H: Uses unleaded solder.

There are a few cases that the part isn't mounted in this model is printed on this diagram.

MD-94 BOARD**SE-130 BOARD**

SECTION 5

IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL PIN FUNCTION (MB-110 BOARD IC104)

Pin No.	Pin name	I/O	Function
1-5	HA17-HA21	O	Address bus A17 to A21
6	HA22	-	Not used
7	WP	O	I2C EEPROM write protect output
8	XSACS	O	SACD DEC Chip select signal output
9	AVCC	-	Power supply (+3.3 V)
10	AVRH	-	Reference power supply (+3.3 V)
11	AVSS	-	Ground
12	AN0	I	Set of mode 0
13	AN1	I	Set of mode 1
14	AN2	I	Set of mode 2
15	AN3	I	Set of mode 3
16	INT0	I	AV DEC Interrupt input
17	INT1	I	ARP Interrupt input
18	INT2	I	SDSP Interrupt input
19	INT3	I	Table Int input
20	INT4	I	IF CON Interrupt input
21	INT5	I	ADSP Interrupt input
22	INT6	I	Table Int input
23	INT7	I	SACD DEC Interrupt input
24	VCC	-	Power supply (+3.3 V)
25	SIO	I	Serial bus 0 (data input)
26	SO0	O	Serial bus 0 (data output)
27	SC0	O	Serial bus 0 (clock output)
28	SII	I	Serial bus 1 (data input)
29	SO1	O	Serial bus 1 (data output)
30	SCI	O	Serial bus 1 (clock output)
31	SI2	I	Serial bus 2 (data input)
32	SO2	O	Serial bus 2 (data output)
33	DVD/SACD	-	Not used
34	VSS	-	Ground
35	XRST	O	System reset signal output
36	WIDE	O	WIDE Select signal output
37	OCSW2	I	Tray sensor input
38	SDA	I/O	I2C data input/output

Pin No.	Pin name	I/O	Function
39	SCL	O	I2C clock output
40	XSARST	O	SACD DEC Reset signal output
41	TRM-	O	Turntable Motor drive output
42	TRM+	O	Turntable Motor drive output
43	MD0	I	Input of mode select 0 (fixed at "H")
44	MD1	I	Input of mode select 1 (fixed at "L")
45	MD2	I	Input of mode select 2 (fixed at "L")
46	DREQ0	I	AV DEC DMA -REQ0 input
47	DACK0	O	AV DEC DMA -ACK0 output
48	XDRVVMUTE	O	Drive mute signal output
49	DREQ1	I	AV DEC DMA -REQ1 input
50	DACK1	O	AV DEC DMA -ACK1 output
51	XIFCS	O	IF CON Chip select signal output
52	VSS	-	Ground
53	X1	O	Clock output (16.5 MHz)
54	X2	I	Clock input (16.5 MHz)
55	VCC	-	Power supply (+3.3 V)
56	CKSW1	I	Chuck Sensor input
57	OCSW1	I	Tray Sensor input
58	CS0X	O	External ROM chip select signal output
59	CS1X	O	Extranal RAM chip select signal output
60	CS2X	O	AV DEC Chip select signal output
61	CS3X	O	AV DEC Chip select signal output
62	CS4X	O	ARP Chip select signal output
63	CS5X	O	SDSP Chip select signal output
64	VCCI	-	Power supply (+1.8 V)
65	CS6X/DSENS	I	Disc interrupt input
66	CS7X	-	Not used
67	XWAIT	I	Wait signal input
68	BGRNTX	I	Test terminal (fixed at 'H')
69	BRQ	-	Not used
70	XRD	O	Read enable signal output
71	XWRH	O	High order-byte write enable signal output
72	XWRL	O	Lower order-byte write enable signal output

Pin No.	Pin name	I/O	Function
73	NMIX	I	Non Maskable Interrupt input (fixed at "H")
74	VCCI	-	Power supply (+1.8 V)
75	VSS	-	Ground
76	XFRRST	I	IF CON Reset signal input
77	CPUCK	O	CPU clock signal output
78	SMUTE	O	SACD mute signal output
79	XDACS	O	DAC (8ch) chip select signal output
80	X38CS	O	ADSP chip select signal output
81	48/44.1K	O	PLL FS control signal output
82	XLDON/XADYCS	O	Laser diode mute signal output
83	MA_MUTE	O	Audio mute signal output
84	XSRWE	O	External RAM write enable signal output
85-92	HD0-HD7	I/O	Data bus D0 to D7 (16 bit only)
93-100	HD8-HD15	I/O	Data bus D8 to D15 (16 bit), D0-D7 (8 bit)
101	VSS	-	Ground
102-109	HA0-HA7	O	Address bus A00 to A07
110	VCC	-	Power supply (+3.3 V)
111-118	HA8-HA15	O	Address bus A08 to A15
119	VSS	-	Ground
120	HA16	O	Address bus A16

SECTION 6

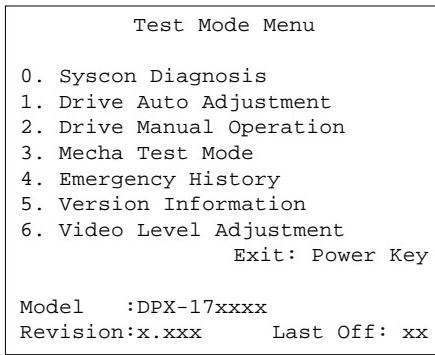
TEST MODE

6-1. GENERAL DESCRIPTION

The Test Mode allows you to make diagnosis and adjustment easily using the remote commander and monitor TV. The instructions, diagnostic results, etc. are given on the on-screen display (OSD).

6-2. STARTING TEST MODE

Press the [TOP MENU], [CLEAR], [] keys on the remote commander in this order with the power of main unit in OFF status, and the Test Mode starts, then "DIAG STARTING START" will be displayed on the fluorescent display tube and the menu shown below will be displayed on the TV screen. At the bottom of menu screen, the model name and revision number are displayed. Last Off at the lower right of screen indicates the information code concerning the last power off. To execute each function, select the desired menu and press its number on the remote commander. To exit from the Test Mode, press the [] key.



Power Off Information Code List

- 00: Primary Power Off
- 01: Power Off Request from SYSTEM CONTROL
- 02: Power Off by Emergency Power Off Command from SYSTEM CONTROL
(if information is sent from SYSTEM CONTROL)
- 03: IF CON Judged that SYSTEM CONTROL is Faulty
- 04: Power Off from Diagnosis Mode of IF CON
- 05: Forced Power Off by the User
- 06: Power Off by Power Supply Voltage Monitor

6-3. SYSCON DIAGNOSIS

The same contents as board detail check by serial interface can be checked from the remote commander. On the Test Mode Menu screen, press [0] key on the remote commander, and the following check menu will be displayed.

```

### Syscon Diagnosis ####
Check Menu
0 . Quit
1 . All
2 . Version
3 . Peripheral
4 . Servo
5 . Supply
6 . AV Decoder
7 . Video
8 . Audio
-

```

0. (Quit)

Quit the Syscon Diagnosis and return to the Test Mode Menu.

1. (All items continuous check)

This menu checks all diagnostic items continuously. Normally, all items are checked successively one after another automatically unless an error is found, but at a certain item that requires judgment through a visual check to the result, the following screen is displayed for the key entry.

```

### Syscon Diagnosis ####
Diag All Check
No. 2 Version

2-3. ROM Check Sum
Check Sum = xxxx

Press NEXT Key to Continue
Press PREV key to Repeat

```

For the ROM Check, the check sum calculated by the Syscon is output, and therefore you must compare it with the specified value for confirmation.

Following the message, press [] key to go to the next item, or [] key to repeat the same check again.

To quit the diagnosis and return to the Check Menu screen, press [] or [ENTER] key. If an error occurred, the diagnosis is suspended and the error code is displayed as shown below.

```
### Syscon Diagnosis ###

3-3. EEPROM Check
Error 03 : EEPROM Write/Read N
Address   : 00000001
Write Data: 2492
Read Data : 2490
Press NEXT Key to Continue
Press PREV key to Repeat
-
```

Press [] key to quit the diagnosis, or [◀◀] key to repeat the same item where an error occurred, or [▶▶] key to continue the check from the item next to faulty item.

* In "All item continuous check", pressing stop or enter will not quit the diagnosis.

Selecting [2] and subsequent items call the submenu screen of each item. When "—" is displayed in the submenu, it means that the test is not supported in the model.

For example, if "5. Supply" is selected, the following submenu will be displayed.

```
### Syscon Diagnosis ###
Check Menu
No. 5 Supply
0. Quit
1. All
2. ARP Register Check
3. ARP to RAM Data Bus
4. ARP to RAM Address Bus
5. ARP RAM Check
-
```

0. (Quit)

Quit the submenu and return to the main menu.

1. (All submenu items continuous check.)

This menu checks 2 and subsequent items successively. At the item where visual check is required for judgment or an error occurred, the checking is suspended and the message is output for key entry. Normally, all items are checked successively one after another automatically unless an error is found.

Selecting [2] and subsequent items executes respective menus and outputs the results.

For the contents of each submenu, see "General Description of Checking Method" and "Check Items List".

General Description of Checking Method

2. Version

(2-2) Revision

ROM revision number is displayed.

Error: Not detected.

The revision number defined in the source file is displayed with four digits.

(2-3) ROM Check Sum

Check sum is calculated.

Error: Not detected.

8-bit data are added up to the ROM address 0x000F0000 to 0x002FFFFF, and the result is displayed with 4-digit hexadecimal number. Error is not detected. Compare the result with the specified value.

(2-4) Model Type

Model code is displayed.

Error: Not detected.

The model code read from the EEPROM is displayed with 2-digit hexadecimal number.

(2-5) Region

Region code is displayed.

Error: Not detected.

The region code determined from the model code is displayed.

(2-6) M't Check

Mount resistance is checked.

Error 22: The region code does not accord.

Check whether the region code that is deduced from model resistance and destination resistance accords with the region code that is deduced from region resistance value.

3. Peripheral

(3-2) EEPROM Check

Data write → read, and accord check

Error 03: EEPROM write/read discord

0x9249, 0x2942 and 0x4294 are written to the address 0x00 to 0xFF of the EEPROM and then read for checking. Before writing, the data are saved, then after checking, they are written to restore the contents of EEPROM.

(3-3) _____

Check no support.

(3-4) _____

Check no support.

(3-5) SACD Check

Device reset → internal organs RAM check.

Error 50: Write and read data discord.

(3-6) VENC Check

Data write → read, and accord check

Error 52: Write/read data discord

Error may occur due to defect of access with syscon.

(3-7) _____

Check no support.

(3-8) EX RAM Check

Test Data write → read, and accord check

Error 02: The external RAM used in the system control is checked.

4. Servo

(4-2) Servo DSP Check

Data write → read, and accord check

Error 12: Read data discord

0x9249, 0x2942 and 0x4294 are written to the RAM address 0x602 of the Servo DSP and then read for checking.

(4-3) _____

Check no support.

(4-4) RF Amp (SSI) W/R Check

Data write → read, and accord check

Error 13: RF Amp register write, and read data discord

Implement 8-bit shift operation of the 0x01 to the readable/writable register of the RF Amp. If once write data do not accord with read data, it is NG.

5. Data Supply System

(5-2) ARP Register Check

Data write → read, and accord check

Error 08: ARP register write, and read data discord

Data 0x00 to 0xFF is written sequentially to the ARP TMAX register (address 0xC6) and then read for checking.

(5-3) ARP to RAM Data Bus

Data write → read, and accord check

Error 09: ARP ←→ RAM data bus error

Data 0x0001 to 0x8000 where one bit each is set to 1 are written to the address 0 of RAM (IC303) connected to the ARP (IC301) through the bus, then they are read and checked. In case of discord, written bit pattern and read data are displayed. If data where multiple bits are 1 are read, the bits concerned may touch each other. Further, if data where certain bit is always 1 or 0 regardless of written data, the line could be disconnected or shorted.

(5-4) ARP to RAM Address Bus

Data write → other address read discord check

Error 10: ARP ←→ RAM address bus error

Caution: Address and data display in case of an error is different from the display of other diagnosis (described later).

Before starting the test, all addresses of RAM (IC303) are cleared to 0x0000.

First, 0xA55A is written to the address 0x00000, and the address data are read and checked from addresses 0x00001 to 0x80000 while shifting 1 bit each. Next, the data at that address is cleared, and it is written to the address 0x00001, and read and checked in the same manner. This check is repeated up to the address 0x80000 while shifting the address data by 1 bit each.

If data other than 0 is read at the addresses except written address, an error is given because all addresses were already cleared to 0. In this check, the error display pattern is different from that of other diagnosis; read data, written address, and read address are displayed in this order. However, the message uses same template, and accordingly exchange Address and Data when reading. The following display, for example,

Syscon Diagnosis

5-4. ARP to RAM Address Bus
Error 10: ARP - RAM Address B
Address : 0000A55A
Write Data : 00000000
Read Data : 00080000
Press NEXT Key to Continue
Press PREV key to Repeat
—

shows the data 0xA55A was read from address 0x00080000 though it was written to the address 0x00000000. This implies that these addresses are in the form of shadow. Also, if the read data is not 0xA55A, another error will be present.

(5-5) ARP RAM Check

Data write → read, and accord check

Error 11: ARP RAM read data discord

The program code data stored in ROM are copied to all areas of RAM (IC303) connected to the ARP (IC301) through the bus, then they are read and checked if they accord. If the detail check was selected initially, the data are written to all areas and read, then the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 11, and the test is suspended.

6. AV Decoder

(6-2) 1935 RAM

Data write → read, and accord check

Error 14: AVD RAM read data discord

The program code data stored in ROM (IC106 or IC107) are copied to all areas of RAM (IC404, 405) connected to the AVD (IC403) through the bus, then they are read and checked if they accord. Further, the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 14, and the test is suspended.

During the test, OSD display becomes blank as the OSD area is also checked.

(6-3) 1935 SP

ROM → AVD RAM → Video OUT

Error: Not detected.

The data including sub picture streams in ROM (IC106 or IC107) are transferred to the RAM (IC404, 405) in AVD (IC403), and output as video signals from the AVD (IC403). Though OSD display becomes blank, the output of video signals continues until the key is pressed.

7. Video Output

(7-2) Color Bar

AVD color bar command write → Video OUT

Error: Not detected.

The command is transferred to the AVD, and the color bar signals are output from video terminals.

(7-3) Composite Out

AVD color bar command write → Video (Composite, Y/C) OUT

Error: Not detected.

The command is transferred to the AVD, and the color bar signals are output from video terminals.

(7-4) _____

Check no support.

(7-5) _____

Check no support.

(7-6) Component Out

AVD color bar command write → Video (Component, Y/C) OUT

Error: Not detected.

The command is transferred to the AVD, and the color bar signals are output from video terminals.

(7-7) _____

Check no support.

8. Audio Output

(8-2) ARP → 1935

Data flow from supply system DRAM to SDRAM of AV Decoder is tested.

Error 15: ARP → 1935 video NG

16: ARP → 1935 audio NG

(8-3) _____

Check no support.

(8-4) Test Tone

Pink noise output

Error: Not detected.

In the models without DD output, the test tone is output from L and R of 2-channel only, and in the models with DD output, the test tone is output from L and R of 2-channel, and all channels of 5.1 output.

After turning on all outputs, each time the [▶] key is pressed, the output channel is switched for individual channel checking.

Diagnosis Check Items List

2. Version Display

- (2-2) Revision
- (2-3) ROM Check Sum
- (2-4) Model Type
- (2-5) Region
- (2-6) M't Check

3. Peripheral

- (3-2) EEPROM Check
- (3-5) SACD Check
- (3-6) VENC Check
- (3-7) _____ (Function not supported)
- (3-8) EX RAM Check

4. Servo

- (4-2) Servo DSP Check
- (4-3) _____ (Function not supported)
- (4-4) RF Amp (SSI) W/R Check

5. Data Supply System

- (5-2) ARP Register Check
- (5-3) ARP to RAM Data Bus
- (5-4) ARP to RAM Address Bus
- (5-5) ARP RAM Check

6. AV Decoder

- (6-2) 1935 RAM
- (6-3) 1935 SP

7. Video Output

- (7-2) Color Bar
- (7-3) Composite Out
- (7-4) _____ (Function not supported)
- (7-5) _____ (Function not supported)
- (7-6) Component Out
- (7-7) _____ (Function not supported)

8. Audio Output

- (8-2) ARP → 1935

- (8-3) Test Tone

Error Codes List

- 00: Error not detected
- 01: RAM write/read data discord
- 03: EEPROM NG
- 04: Flash memory clear error
- 05: Flash memory write error
- 06: Flash memory read data discord
- 08: ARP register read data discord
- 09: ARP ←→ RAM data bus error
- 10: ARP ←→ RAM address bus error
- 11: ARP RAM read data discord
- 12: Servo DSP NG
- 13: RF Amp NG
- 14: 1935 SDRAM NG
- 15: ARP → 1935 video NG
- 16: ARP → 1935 audio NG
- 1A: System call error (Function not supported)
- 1B: System call error (Parameter error)
- 1C: System call error (Illegal ID number)
- 20: System call error (Time out)
- 22: Resistor installation error
- 50: SACD Decoder W/R NG
- 52: Video Encoder W/R NG
- 55: External RAM W/R NG
- 90: Error occurred
- 91: User verification NG
- 92: Diagnosis cancelled

6-4. DRIVE AUTO ADJUSTMENT

DVD reference disc

Single Layer

HLX-503 (J-6090-069-A) (NTSC) OR

HLX-504 (J-6090-088-A) (NTSC)

Dual Layer

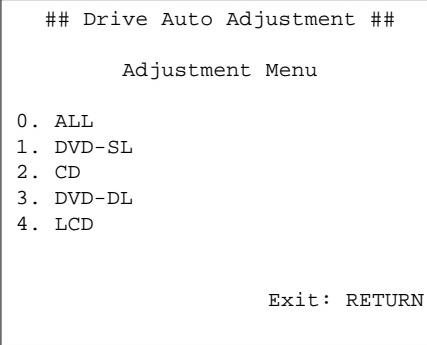
HLX-501 (J-6090-071-A) (NTSC) OR

HLX-505 (J-6090-089-A) (NTSC)

TEST CD

YEDS-18 (3-702-101-01)

On the Test Mode Menu screen, press [1] key on the remote commander, and the drive auto adjustment menu will be displayed.



Normally, [0] is selected to adjust DVD (single layer), CD, and DVD (dual layer) in this order. But, individual items can be adjusted for the case where adjustment is suspended due to an error. In this mode, the adjustment can be made easily through the operation following the message displayed on the screen. Which disc is currently adjusted is displayed on the fluorescent display tube.

0. ALL

You will be asked if EEPROM data are initialized or not, and for this prompt, select [0] and press the [ENTER] key. First, the servo setting data in EEPROM, Emergency History and Hour Meter are cleared to initialize. Then, [1] DVD-SL disc, [2] CD disc, and [3] DVD-DL disc are adjusted in this order. Because the changer model can accept multiple discs in advance of adjustment, adjustments can be continued by exchanging discs automatically whenever an adjustment is completed following the instruction on screen. You can exit the adjustment by pressing the [■] button. In adjusting each disc, the mirror time is measured to check the disk type. In the auto adjustment, whether the disc type is correct is not checked unlike conventional models, and accordingly, take care not to insert a different type of disc.

1. DVD Single Layer Disc

Select [1], insert DVD single layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. The table No. 1 is used in the changer type model. If there is no disc on the table No. 1, the tray will be open to wait for closing. If there is a disc on the table, the adjustment starts immediately. If you put a disc prior to adjustment, confirm that the SL disc is set on the table 1.

DVD Single Layer Disc Adjustment Steps

1. Sled Reset
2. Disc Check Memory SL
3. Set Disc Type SL
4. Spdl Start
5. LD ON
6. Focus Error Check
7. Focus ON 0 with PI Level measure
8. Auto Track Offset Adjust L0
9. Trv Level Check
10. Tracking ON
11. CLVA ON
12. Sled ON
13. Auto Focus Balance Adjust
14. Auto Loop Filter Offset Adjust
15. Auto Focus Gain Adjust L0
16. Auto Focus Balance Adjust L0
17. EQ Boost Adjust
18. Auto Loop Filter Offset Adjust
19. Auto Tracking Gain Adjust
20. RF Level Measure
21. Jitter measure
22. Eep Copy Loop Filter Offset
23. All Servo Stop

2. CD Disc

Select [2], insert CD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. The table No. 2 is used in the changer type model. If there is no disc on the table No. 2, the tray will be open to wait for closing. If there is a disc on the table, the adjustment starts immediately. If you put a disc prior to adjustment, confirm that the CD is set on the table 2.

CD Adjustment Steps

1. Sled Reset
2. Disc Check Memory CD
3. Set Disc Type CD
4. Spdl Start
5. LD ON
6. Focus Error Check
7. Fcs ON 1 with PI Level measure
8. Auto Track Offset Adjust L0
9. Trv Level Check
10. Tracking ON
11. CLVA ON
12. Sled ON
13. Auto Focus Balance Adjust
14. Auto Loop Filter Offset Adjust
15. Auto Focus Gain Adjust L0
16. Auto Focus Balance Adjust L0
17. Eq Boost Adjust
18. Auto Loop Filter Offset Adjust
19. Auto Track Gain Adjust
20. Copy Adjustment Data to LCD
21. RF Level Measure
22. Jitter measure
23. All Servo Stop

3. DVD Dual Layer Disc

Select [3], insert DVD dual layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. The table No. 3 is used in the changer type model. If there is no disc on the table No. 3, the tray will be open to wait for closing. If there is a disc on the table, the adjustment starts immediately. If you put a disc prior to adjustment, confirm that the DL disc is set on the table 3.

DVD Dual Layer Disc Adjustment Steps

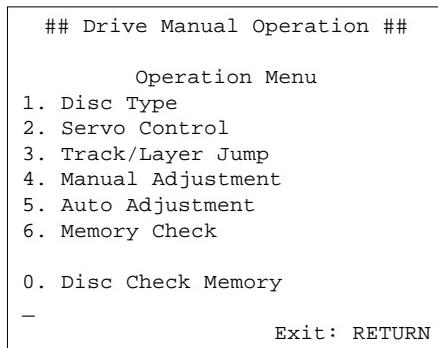
1. Sled Reset
2. Disc Check Memory DL
3. Set Disc Type DL
4. DVD DL Layer 1 Adjust
5. Spdl Start
6. LD ON
7. Fcs ON 1 with PI Level measure
8. Auto Track Offset Adjust L1
9. Tracking ON
10. Clva ON
11. Sled ON
12. Auto Focus Balance Adjust
13. Auto Focus Gain Adjust L1
14. Auto Focus Balance Adjust L1
15. Eq Boost Adjust L1
16. Auto Track Gain Adjust L1
17. Jitter measure
18. DVD DL Layer 0 Adjust
19. Focus Jump (L1 → L0)
20. Auto Track Offset Adjust L0
21. Tracking ON
22. Clva ON
23. Sled ON
24. Auto Focus Balance Adjust
25. Auto Focus Gain Adjust L0
26. Auto Focus Balance Adjust
27. Eq Boost Adjust L0
28. Auto Track Gain Adjust L0
29. Jitter measure
30. All Servo Stop

4. LCD

LCD disc is not adjusted because the adjusted data of CD are reflected, and SACD (hybrid disc) is not adjusted because the adjusted data of CD and DVD-DL are reflected.

6-5. DRIVE MANUAL OPERATION

On the Test Mode Menu screen, select [2], and the manual operation menu will be displayed. For the manual operation, each servo on/off control and adjustment can be executed manually.



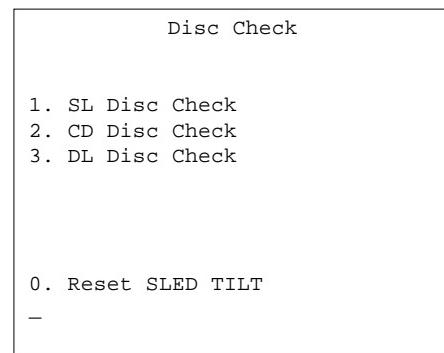
In using the Manual Operation menu, take care of the following points. These commands do not provide protection, thus requiring correct operation. The sector address or time code field is displayed when a disc is loaded.

1. Set correctly the disc type to be used on the Disc Type setting screen.
The Disc Type setting must be performed after a disc was loaded.
The set Disc Type is cleared when the tray is opened.
2. After power ON, if the Manual Operation was selected, first perform "Reset SLED TILT" by opening 1. Disc Type screen.
3. In case of an alarm, immediately press the [■] button to stop the servo operation, and turn the power OFF.

Basic operation (controllable from front panel or remote commander)

I/O	: Power OFF
[■]	: Servo stop
(OPEN/CLOSE)	: Stop+Eject/Loading
[RETURN]	: Return to Operation Menu or Test Mode Menu
[▶] , [◀]	: Transition between sub modes of menu
[1] to [9], [0]	: Selection of menu and items
Cursor [↑]/[↓]	: Increase/Decrease in manually adjusted value

0. Disc Check Memory

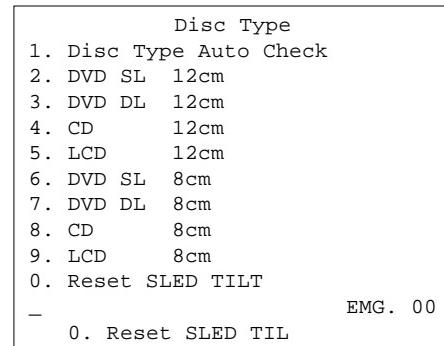


On this screen, the mirror time is measured and written to the EEPROM to check the disc type. First, set a DVD SL disc and press [1], then set a CD disc and press [2], and finally set a DVD DL disc and press [3]. The measured mirror time is displayed respectively.

The adjustment must be executed more than once after default data were written.

From this screen, you can go to another mode by pressing [▶] or [◀] key, but you cannot enter this mode from another mode. You can enter this mode from the Operation Menu screen only.

1. Disc Type



On this screen, select the disc type. To select the disc type, press the number of the loaded disc. The selected disc type is displayed at the bottom. Selecting [1] automatically selects and displays the disc type. In case of wrong display, retry "Disc Check Memory". Also, opening the tray causes the set disc type to be cleared. In this case, set the disc type again after loading.

In performing manual operation, the disc type must be set.

Once the disc type has been selected, the sector address or time code display field will appear as shown below. These values are displayed when PLL is locked.

Disc Type		
1. Disc Type	Auto Check	
2. DVD SL	12cm	
3. DVD DL	12cm	
4. CD	12cm	
5. LCD	12cm	
6. DVD SL	8cm	
7. DVD DL	8cm	
8. CD	8cm	
9. LCD	8cm	
0. Reset SLED TILT		
	SA.-----	SI.-- EMG.00
DVD SL	12cm	

Display when DVD SL 12cm disc was selected

Disc Type		
1. Disc Type	Auto Check	
2. DVD SL	12cm	
3. DVD DL	12cm	
4. CD	12cm	
5. LCD	12cm	
6. DVD SL	8cm	
7. DVD DL	8cm	
8. CD	8cm	
9. LCD	8cm	
0. Reset SLED TILT		
	TC.--:---	EMG.00
CD	12cm	

Display when CD 12cm disc was selected

- ① [0] Reset SLED TILT : Reset the Sled and Tilt to initial position.
(Reset the Sled only to initial position because the Tilt mechanism is not available in this model.)
- ② [1] Disc Type Check : Judge automatically the loaded disc. As the judged result is displayed at the bottom of screen, make sure that it is correct. If Disc Check Memory menu has not been executed after EEPROM default setting, the disc type cannot be judged. In this case, return to the initial menu and make a check for three types of discs (SL, DL, CD).
- ③ [2] to [9] : Select the loaded disc. The adjusted value is written to the address of selected disc. No further entry is necessary if ① was selected.

2. Servo Control

Servo Control		
1. LD	Off	R. Sled FWD
2. SP	Off	L. Sled REV
3. Focus	Off	
4. TRK.	Off	
5. Sled	Off	
6. CLVA	Off	
7. FCS. Srch	Off	
0. Reset SLED TILT		
-	SA.-----	SI.-- EMG.00
	DVD SL	12cm
		Jitter 00

On this screen, the servo on/off control necessary for replay is executed. Normally, turn on each servo from 1 sequentially and when CLVA is turned on, the usual trace mode becomes active. In the trace mode, DVD sector address or CD time code is displayed. This is not displayed where the spindle is not locked.

The spindle could run overriding the control if the spindle system is faulty or RF is not present. In such a case, do not operate CLVA.

- ① [0] Reset SLED TILT : Reset the Sled and Tilt to initial position.
(Reset the Sled only to initial position because the Tilt mechanism is not available in this model.)
- ② [1] LD : Turn ON/OFF the laser.
- ③ [2] SP : Turn ON/OFF the spindle.
- ④ [3] Focus : Search the focus and turn on the focus.
- ⑤ [4] TRK. : Turn ON/OFF the tracking servo.
- ⑥ [5] Sled : Turn ON/OFF the sled servo. When PLL is not locked (cannot be locked), the sled servo is not turned ON. The display keeps OFF.)
- ⑦ [6] CLVA : Turn ON/OFF normal servo of spindle servo.
- ⑧ [7] FCS. Srch : Apply same voltage as that of focus search to the focus drive to check the focus drive system.
- ⑨ [8] Sled FWD : Move the sled outward. Perform this operation with the tracking servo turned off.
- ⑩ [9] Sled REV : Move the sled inward. Perform this operation with the tracking servo turned off.

3. Track/Layer Jump

Track/Layer Jump			
1.	1Tj	FWD	R. Fj (L1->L0)
2.	1Tj	REV	L. Fj (L0->L1)
3.	2Tj	FWD	U. Lj (L1->L0)
4.	2Tj	REV	D. Lj (L0->L1)
5.	NTj	FWD	
6.	NTj	REV	
7.	500Tj	FWD	
8.	500Tj	REV	
9.	10k/20k	FWD	
0.	10k/20k	REV	
—			SA.----- SI.-- EMG.00
	DVD DL	12cm	Jitter FF

On this screen, track jump, etc. can be performed. Only for the DVD-DL, the focus jump and layer jump are displayed in the right field.

- [1] 1Tj FWD : 1-track jump forward.
- [2] 1Tj REV : 1-track jump reverse.
- [3] 2Tj FWD : 2-track jump forward.
- [4] 2Tj REV : 2-track jump reverse.
- [5] NTj FWD : N-track jump forward.
- [6] NTj REV : N-track jump reverse.
- [7] 500Tj FWD : Fine search forward.
- [8] 500Tj REV : Fine search reverse.
- [9] 10k/20k FWD : Direct search forward.
- [0] 10k/20k REV : Direct search reverse.

- The following commands are valid for DVD-DL disc only –
- (L1 → L0): Focus jump (Trk/Sled Servo OFF) forward.
- ← (L0 → L1): Focus jump (Trk/Sled Servo OFF) reverse.
- ↑ (L1 → L0): Layer jump (Trk/Sled Servo ON) forward.
- ↓ (L0 → L1): Layer jump (Trk/Sled Servo ON) reverse.

4. Manual Adjustment

Manual Adjustment:Up/Down	
1.	TRK. Offset
2.	Focus Gain
3.	TRK. Gain
4.	Focus Offset
5.	Focus Balance
6.	L.F. Offset
7.	Analog FRSW
8.	PLL Dac Gain
9.	EQ BOOST
0.	TRK. Balance
—	SA.----- SI.-- EMG. 00
	DVD SL 12cm Jitter FF

On this screen, each item can be adjusted manually. Select the desired number [1] to [0] from the remote commander, and current setting for the selected item will be displayed, then increase or decrease numeric value with [↑] key or [↓] key. This value is stored in the EEPROM. If CLV has been applied, the jitter is displayed for reference for the adjustment.

- [1] TRK. Offset : Adjusts tracking offset.
- [2] Focus Gain : Adjusts focus gain.
- [3] TRK. Gain : Adjusts track gain.
- [4] Focus Offset : Adjusts focus offset.
- [5] Focus Balance : Adjusts focus balance.
- [6] L.F. Offset : Adjusts loop filter offset.
- [7] Analog FRSW : Sets select switch of analog feedback circuit.
- [8] PLL Dac Gain : Adjusts D/A converter gain of PLL.
- [9] EQ BOOST : Adjusts boost amount of equalizer.
- [0] TRK. Balance : Adjusts tracking balance.

5. Auto Adjustment

Auto Adjustment					
1.	Auto TRK.	Offset			
2.	Auto FCS	Balance			
3.	Auto Focus	Offset			
4.	Auto Focus	Gain			
5.	Auto TRK.	Gain			
6.	Auto EQ.				
7.	Auto L.F.	Offset			
8.	Auto Group	Delay			
9.	Auto TRK.	Balance			
SA.-----		SI.--	EMG.00		
DVD	SL	12cm	Jitter	FF	

On this screen, each item can be adjusted automatically. Select the desired number [1] to [8] from the remote commander, and selected item is adjusted automatically.

- [1] Auto TRK. Offset : Adjusts tracking offset.
- [2] Auto Focus Balance : Adjusts focus balance.
- [3] Auto Focus Offset : Adjusts focus offset.
- [4] Auto Focus Gain : Adjusts focus gain.
- [5] Auto TRK. Gain : Adjusts track gain.
- [6] Auto EQ
- [7] Auto L.F. Offset : Adjusts loop filter offset.
- [8] Auto Group Delay
- [9] Auto TRK. Balance : Adjusts tracking balance.

6. Memory Check

The display image is shown below and three screens in total can be selected.

EEPROM Data 1						-- DL --
	CD	LCD	SL	L0	L1	
Focus Gain	xx	xx	xx	xx	xx	
TRK. Gain	xx	xx	xx	xx	xx	
FCS Balance	xx	xx	xx	xx	xx	
Focus Bias	xx	xx	xx	xx	xx	
TRV. Offset	xx	xx	xx	xx	xx	
L.F. Offset	xx	xx	xx	xx	xx	
EQ. Boost	xx	xx	xx	xx	xx	

- UP : Last Data
 DOWN : Next Data
 CLEAR : Default Set page.1/3

EEPROM Data 2						-- DL --
	CD	LCD	SL	L0	L1	
RF Jitter	xx	--	xx	xx	xx	
RF Level	xx	--	xx	--	--	
FE Level	xx	--	xx	--	--	
FE Balance	xx	--	xx	--	--	
TRV.Level	xx	--	xx	--	--	
TE Gain	xx	xx	--	--	--	
PI Level	xx	--	xx	xx	--	

- UP : Prev Data
 DOWN : Next Data
 CLEAR : Default Set page.2/3

EEPROM Data 3						-- DL --
	CD	LCD	SL	L0	L1	
Analog FRSW	xx	xx	xx	xx	xx	
PLL Dac Gain	xx	xx	xx	xx	xx	
Mirror Time	xx	xx	xx	xx	xx	
TRK. Balance	xx	xx	xx	xx	xx	

THR A&L : xx xx xx/xx xx xx

- UP : Prev Data
 DOWN : First Data
 CLEAR : Default Set page.3/3

On this screen, current servo adjusted data stored in the EEPROM are displayed. The adjusted data are initialized by pressing the [CLEAR] key, but be careful that they are not recoverable after initialization.

Before clearing the adjusted data, make a note of the set data. This screen will also appear if [0] All is selected in the Drive Auto Adjustment. In this case, default setting cannot be made.

“THR A&L” data on the third page cannot be changed if default setting is once made.

6-6. MECHA TEST MODE

Please refer to “6-12. MECHANISM TEST MODE ADJUSTMENT” on page 6-22 about this mode.

6-7. EMERGENCY HISTORY

```
### EMG. History ###

Laser Hours CD xxh xxm
                  DVD xxh xxm

1. 00 00 00 00    00 00 00 00
  00 00 00 00    00 00 00 00

2. 00 00 00 00    00 00 00 00
  00 00 00 00    00 00 00 00

-
Select : 1-9   Scroll : UP/DOWN
(1: Last EMG.) Exit : RETURN
```

On the Test Mode Menu screen, selecting [4] displays the information such as servo emergency history. The history information from last “1” up to “10” can be scrolled with \uparrow key or \downarrow key. Also, specific information can be displayed by directly entering that number with the ten-key pad from [1] to [9]. The upper two lines display the laser ON total hours. Data below minutes are omitted.

Clearing History Information

- Ⓐ Clearing laser hours
Press [DISPLAY] and [CLEAR] keys in this order.
Both CD and DVD data are cleared.
- Ⓑ Clearing emergency history
Press [TOP MENU] and [CLEAR] keys in this order.
- Ⓒ Initializing setup data
Press [MENU] and [CLEAR] keys in this order.
The data have been initialized when “Set Up Initialized” message is displayed.
The EMG. History display screen will be restored soon.

6-8. VERSION INFORMATION

```
### Version Infomation ###

IF con. Ver.x.xxx(xxxx)
      Group xx

SYScon. Ver.x.xxx(xxxx)
      Model xx
      Region 0x

Servo DSP Ver: x.xxx
AVD ucode Ver: xxxxxxxx

Exit : RETURN
```

The ROM version, region code, OPT type, etc. are displayed if [5] is selected in the Test Mode Menu. The parenthesized hexadecimal number in the version number field indicates the checksum value of the ROM.

* Note after Downloading

After downloading ROM data, sometimes it happens that checksum is not the same as that of ROM data that has been downloaded. In such a case, go back to the menu screen and select “0. Syscon Diagnosis”, then select “1. All” in “2. Version”. If the result of this operation does not give an agreement, it must be either Download error or ROM error.

6-9. VIDEO LEVEL ADJUSTMENT

On the Test Mode Menu screen, selecting [6] displays color bars for video level adjustment. During display of color bars, OSD disappears but the menu screen will be restored if pressing any key.

6-10. IF CON SELF DIAGNOSTIC FUNCTION

1. IF-103 BOARD (IF CON) TEST MODE

The front board test mode is the IF CON self diagnostic mode. The IF CON can diagnose the functions of the front panel boards that the IF CON controls. Normally, the IF CON makes a serial communication with the SYSTEM CONTROL and operates following the commands from the SYSTEM CONTROL, but in the Test mode, the IF CON operates independently from the SYSTEM CONTROL.

In the Test mode, the following functions can be checked.

1. Button function
2. Remote commander receiving function
3. SYSTEM CONTROL-IF CON serial communication
4. Click shuttle function
5. Fluorescent display tube lighting check
 - Grid check
 - Anode check
6. LED control function

In the Test mode, the set operates same as usual, except voltage monitoring, communication monitoring, display of fluorescent display tube, and LED control.

1. The routine that monitors +3.3 V (P-CONT) of MB-110 board is not provided.
2. The monitoring timer for serial communication with the SYSTEM CONTROL is not provided. The set is not placed in the Standby mode, even if the communication with SYSTEM CONTROL is normal.
3. Display of fluorescent display tube (normally, display is made following the commands from SYSTEM CONTROL)
4. LED control (normally, control is made following the commands from SYSTEM CONTROL)

2. OPERATION OF SELF CHECK MODE

The Self Check mode is the function to conduct the basic test to the FL display and DVD panel section.

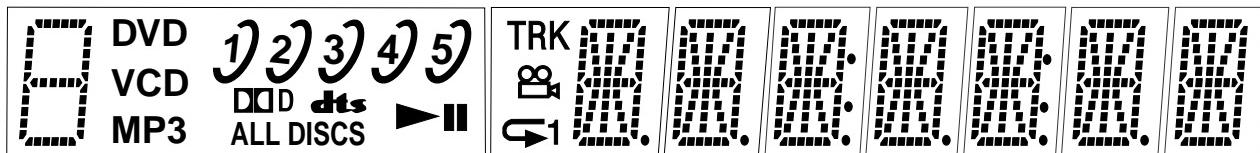
2-1. Self Check Mode Transition Processing

At the AC Power ON after IF CON (IC404) was reset, the input to 10pin (SELF CHECK) is judged and if "Low" is entered, the main unit transits to the Self Check mode. In this port input judgment, the result of 3-time attempts must be same (assuming that the MB-110 board are not connected). While pressing the [■] key on the main unit with the IF CON in STANDBY mode, enter [RETURN] → [DISPLAY] on the remote commander, and the unit transits to the Self Check Mode. The Self Check mode terminates when the IF CON transits to the STANDBY mode.

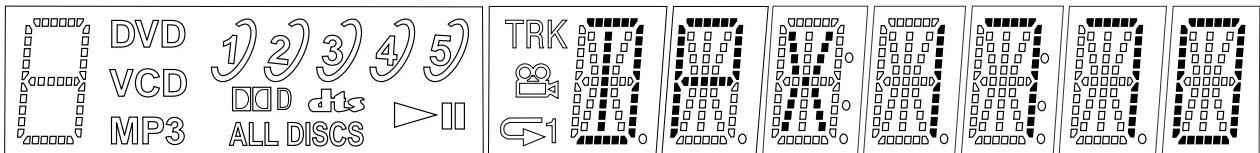
2-2. Operation of Auto Self Check

When the Self Check mode becomes active at the AC Power ON or by key input, the test display of the following steps (1) to (4) is repeated.

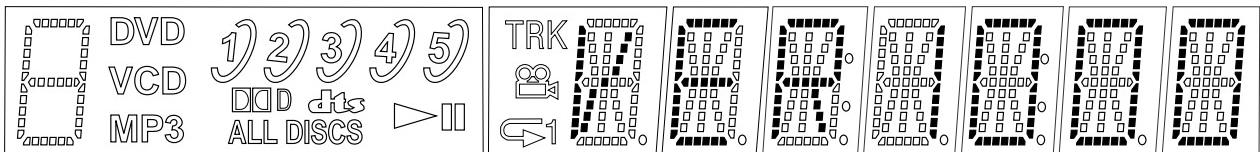
(1) FLD and LED all ON (for 5 seconds)



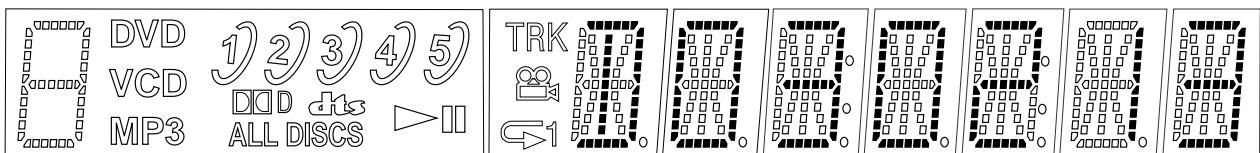
(2) MODEL display (for 2 seconds)



(3) Version display (for 2 seconds)



(4) ROM creation date display (for 2 seconds)



2-3. Each Self Check Function

Each Self Check function tests the FLD display, LED display, and key input.

Input Voltage [V]	IC404: Pin No. (Single)					
	Pin ② (KEY M)	Pin ③ (KEY S)	Pin ④ (KEY PL)	Pin ⑤ (KEY 0)	Pin ⑥ (KEY PO)	Pin ⑦ (KEY L)
0 – 0.21	MULTI/2CH	STOP	PLAY	OPEN/CLOSE	POWER	LOAD
0.63 – 0.86	SACD/CD	–	PAUSE	EXCHANGE	DISC SELECT 5	ONE/ALL
1.23 – 1.55	–	–	PREV	DISC SKIP	DISC SELECT 4	PICTURE MODE
1.9 – 2.25	–	–	NEXT	PROGRESSIV	DISC SELECT 3	SURROUND
2.63 – 2.86	–	–	–	–	DISC SELECT 2	DISC SELECT 1
5.0	–	–	–	–	–	–

Vref = 3.5V

2-3-1. FLD and LED All ON

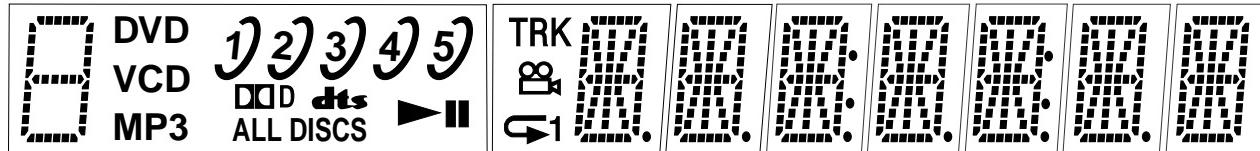
2-3-1-1. Transition Keys in Self Check Mode

- key on the remote commander

2-3-1-2. Operation and Display

In this mode, all LEDs except STANDBY LED and all segments of FLD turn ON.

Example of FLD all ON



2-3-2. Main Unit Key Name Display and Key Code Display

Display

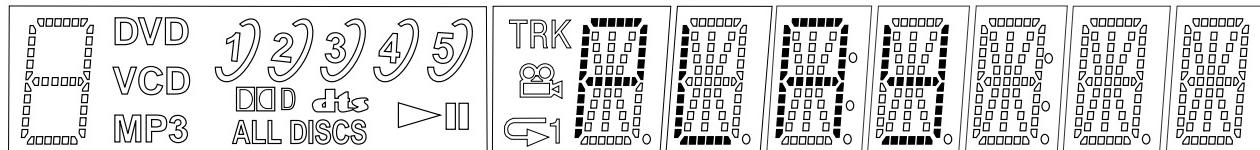
2-3-2-1. Transition Keys in Self Check Mode

- Keys on main unit except keys transited in self check

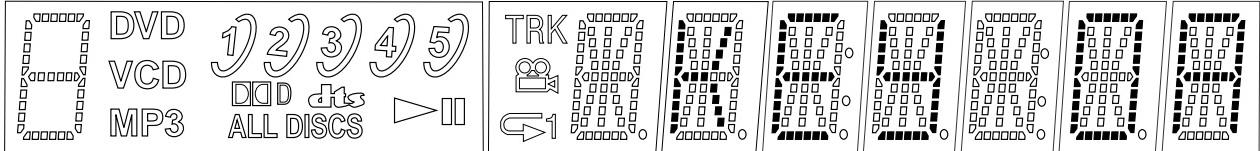
2-3-2-2. Operation and Display

When a key on the main unit is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the [DISPLAY] key on the remote commander. "NOTHING" is displayed when nothing is entered. Also, DVD and VCD segments turn on when a communication error occurred.

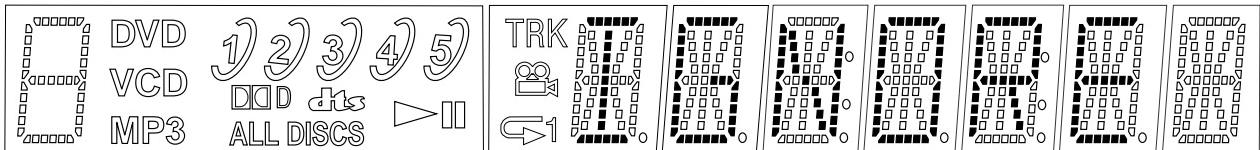
FLD display (at input of key on the main unit)



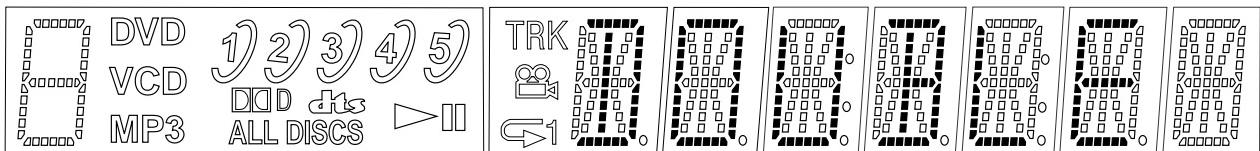
Key code display (at input of **►** key, Key code: 0Ah)



At input of faulty voltage



When two keys are pressed



2-3-3. Remote Commander Key Name Display and Key Code Display

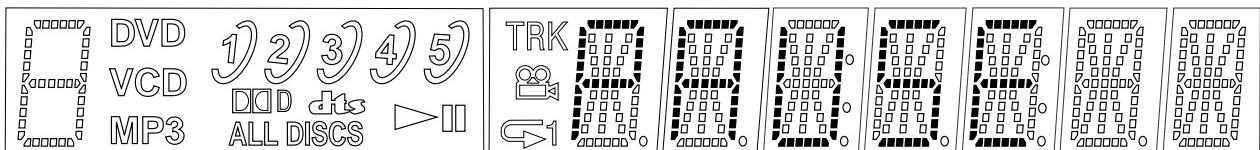
2-3-3-1. Transition Keys in Self Check Mode

Remote commander keys except keys transited in self check

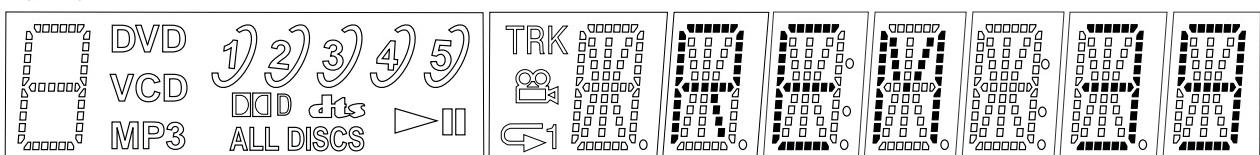
2-3-3-2. Operation and Display

When a key on the remote commander is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the **[DISPLAY]** key on the remote commander. "NOTHING" is displayed when nothing is entered. Also, DVD and VCD segments turn on when a communication error occurred.

Remote commander key name display (at input of **■** (PAUSE) key)



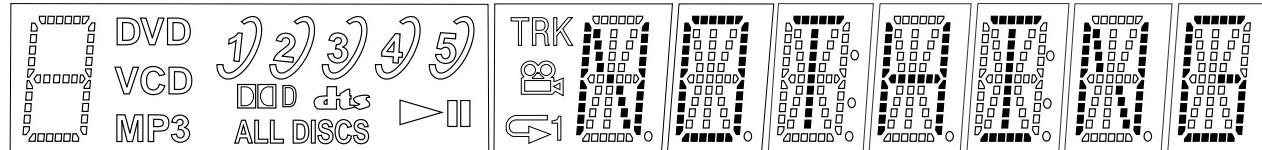
Remote commander key code display (at input of **■** (PAUSE) key, Key code: 39h)



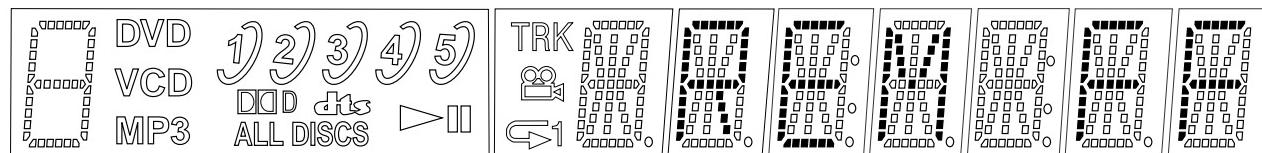
2-3-4. Communication Monitoring Display

The communication state is monitored and displayed while the key name on the main unit and the remote commander is displayed. When the communication to the System Controller failed, DVD and VCD segments turn on.

Communication error display (at no key input)



Communication error display (at code display without input of the remote commander)



2-3-5. FLD Anode Test Display and SHUTTLE Click

Operation Test

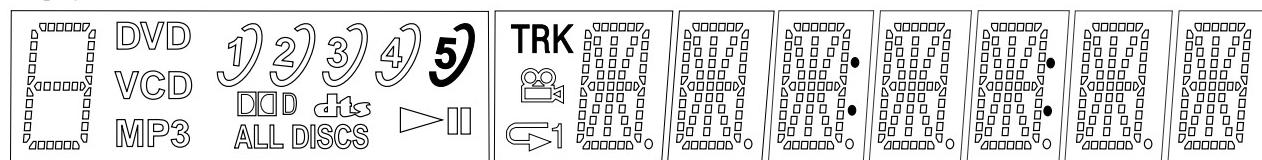
2-3-5-1. Transition Keys in Self Check Mode

- on the remote commander
- SHUTTLE on the remote commander during Anode Test display
(This model does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

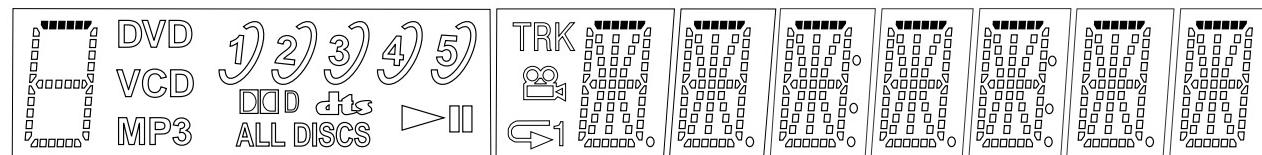
2-3-5-2. Operation and Display

The Self Check mode transits to this mode when ■ key is entered. Only the first segment of each grid of FLD turns on, and each time the SHUTTLE is entered, the segment of each grid is switched in order. When SHUTTLE input is clockwise, the segment switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each segment turns on individually.

Display at the start of Anode Test



↓ (Input in CW direction)



2-3-6. FLD Grid Test Display and SHUTTLE Click Operation Test

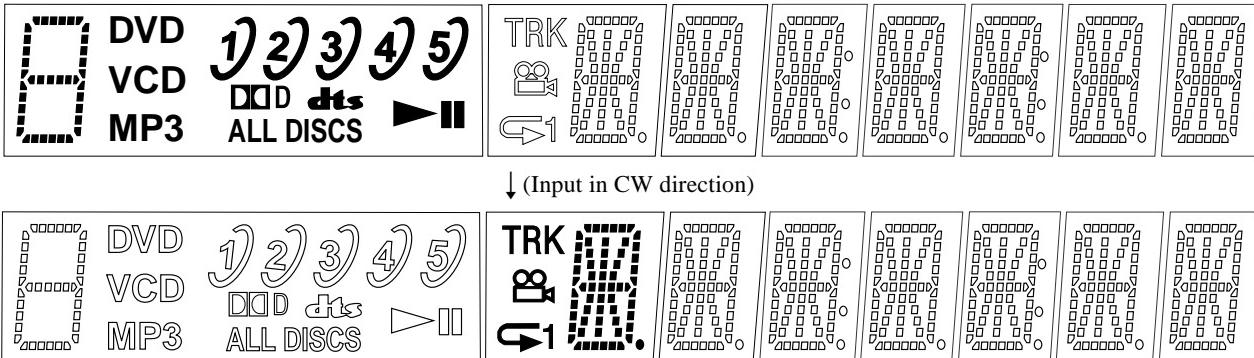
2-3-6-1. Transition Keys in Self Check Mode

- on the remote commander
- SHUTTLE on the remote commander during Grid Test display
(This model does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

2-3-6-2. Operation and Display

The Self Check mode transits to this mode when key is entered. The first grid of FLD all turns on and other grids turn off. Each time the SHUTTLE is entered, the grid is switched in order. When SHUTTLE input is clockwise, the grid switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each grid turns on individually.

Display at the start of Grid Test



2-3-7. LED Test Display

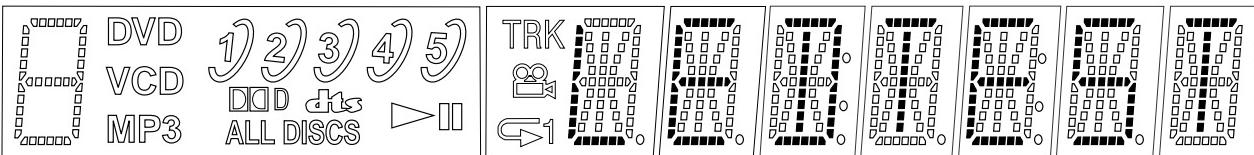
2-3-7-1. Transition Keys in Self Check Mode

- on the remote commander
- SHUTTLE on the remote commander during LED Test display
(This model does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

2-3-7-2. Operation and Display

LED is switched in order by the input of JOG/SHUTTLE. Also, LED ON/OFF is switched by the input of same key as the function that turns on the LED concerned.

FLD display during LED Test



2-3-8. Beep Sound Test

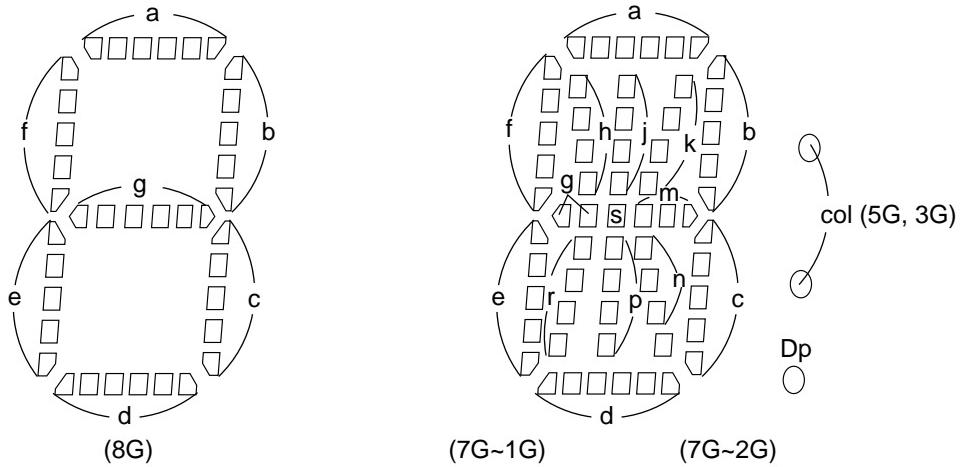
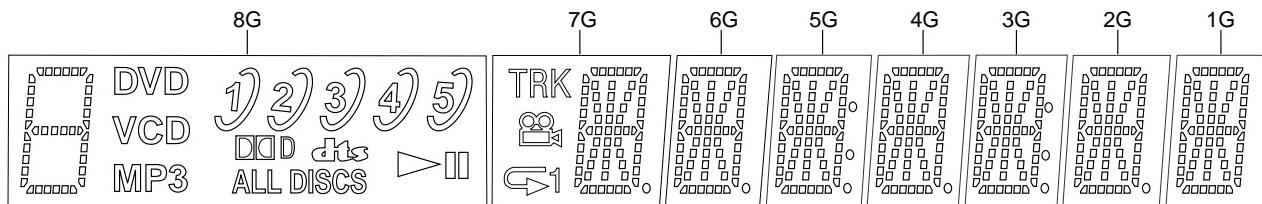
2-3-8-1. Transition Keys in Self Check Mode

- Input of a key on main unit

2-3-8-2. Operation and Display

In the Self Check mode, each time a key on the main unit is entered, a beep sound of 1kHz (100ms) is generated.

GRID ASSIGNMENT



ANODE CONNECTION

	8G	7G	6G	5G	4G	3G	2G	1G
P1	5	TRK	-	col	-	col	-	-
P2	a	a	a	a	a	a	a	a
P3	4	h	h	h	h	h	h	h
P4	3	j	j	j	j	j	j	j
P5	2	k	k	k	k	k	k	k
P6	b	b	b	b	b	b	b	b
P7	f	f	f	f	f	f	f	f
P8	1	m	m	m	m	m	m	m
P9	DVD	s	s	s	s	s	s	s
P10	g	g	g	g	g	g	g	g
P11	e	e	e	e	e	e	e	e
P12	V	n	n	n	n	n	n	n
P13	CD	p	p	p	p	p	p	p
P14	DD	r	r	r	r	r	r	r
P15	c	c	c	c	c	c	c	c
P16	d	d	d	d	d	d	d	d
P17	MP3	Dp	Dp	Dp	Dp	Dp	Dp	-
P18	II	1	-	-	-	-	-	-
P19	▶	◀	-	-	-	-	-	-
P20	dts	2	-	-	-	-	-	-
P21	ALL DISCS	-	-	-	-	-	-	-

6-11. TROUBLESHOOTING

6-11-1. Cannot Enter Test Mode

You cannot enter the Test mode when either button has been pressed by any reason with the board assembled in the front panel. In this state, the power does not turn on even under normal condition (the unit is kept in standby state), and also no button is active and the remote commander is not accepted. In this case, disconnect the MB-110 board and AV-74 board, and with the SELF CHECK (pin ⑩) of IF CON (IC404) on the IF-103 board kept in low state, supply AC, and the IF CON self-diagnosis mode will be forcibly activated. The IF CON (IC404) checks the SELF CHECK port only after the power on reset (only at AC supply, not in standby state). If any button is pressed, its name is displayed on the fluorescent display tube. But, if other than "NOTHING" is displayed though no button is pressed, it means that any button has been pressed.

6-11-2. Faults in Test Mode (MB-110 board)

1. The test mode menu is not displayed.

1-1. Board visual check

Check that the ICs of SYSCON (IC104), ROM (IC106 or IC107), AVD (IC403), ARP & SERVO (IC301) are working correctly.

Check that outside appearance of the ICs is normal.

Check that IC pins are not short-circuited.

Check that there is no soldering error.

Check that outside appearance of the capacitors and resistors is normal.

1-2. Power supply voltage check

Check the power voltage of the power connector (CN103).

Check the power voltage of SYSCON (IC104).

Check the power voltage of ROM (IC106 or IC107).

Check the power voltage of AVD (IC403).

Check the power voltage of ARP & SERVO (IC301).

If the power voltage has any abnormality →

Check that the power supply lines are not shorted.

Check that there is no soldering error.

If any abnormality cannot be found still →

Check that each IC is working normally.

1-3. Clock signal check

Measure the clock signal frequency at CPUCK (CL102) of SYSCON (IC104) with an oscilloscope.

If the 8.25 MHz signal appears. → Check the machine according to section 1-3-1

If the 33 MHz signal appears. → Check the machine according to section 1-3-2.

If other frequencies are output.

R106 and R107 have defective soldering, X101 crystal oscillator is defective.

If the measurement point is fixed to either "H" or "L". →

Observe XFRRST (pin-⑦) of SYSCON (IC104) with an oscilloscope.

If the measurement point is "L", check the following items.

If the IC has defective soldering, if the IC is short-circuited.

If the measurement point is "H",

→ Component X101 or SYSCON (IC104) is defective.

1-3-1. When the 8.25 MHz signal appears at CPUCK

• Check the XRD, XWRH and CS0X signal.

Observe XRD (pin-⑩), XWRH (pin-⑪), and CS0X (pin-⑫) of SYSCON (IC104) with an oscilloscope.

If these pins are fixed to either "L" (0V) or "H" (3.3V), or if these pins stay in the center voltage, check the followings.

Check if the signal line does not have the defective soldering.

Check if the signal line is short-circuited with other signal lines.

If you cannot find any problem → SYSCON (IC104) is defective.

• HA [0 to 21] signal and HD [0 to 15] signal check

Observe HA [0 to 21] (pins-⑬ to ⑯, ⑭ to ⑯, ⑮ to ⑯, ① to ⑤) of SYSCON (IC104) and HD [0 to 15] (pins-⑭ to ⑯) with an oscilloscope.

If these pins are fixed to either "L" (0V) or "H" (3.3V), or if the HA pin stays in the center voltage, check the followings. (HD stays in the center voltage when it is normal.)

→ Check if the signal line does not have the defective soldering, or is short-circuited with other signal line or SYSCON (IC104) is defective.

• Reset signal check

Check if XFRRST (pin-⑦) of SYSCON (IC104) normal or not.

The signal starts up at the same time as Vcc → Defective soldering.

If the trouble does not apply to any of the above-described phenomenon, SYSCON (IC104) or ROM (IC106 or IC107) is defective.

1-3-2. When the 33 MHz signal appears at CPUCK

• WAIT signal check

Observe XWAIT (pin-⑥⑦) of SYSCON (IC104) with an oscilloscope.

If it is fixed to "L" (0V). → Observe CS2X to CS5X (pins-⑥⑧ to ⑩⑨).

If CS2X or CS3X is "L". → AVD (IC403) has defective soldering or AVD is defective.

If CS4X or CS5X is "L". → ARP & SERVO (IC301) has defective soldering or ARP & SERVO is defective.

If any one of the above is not "L". → XWAIT or CSnX is short-circuited or has the defective soldering or AVD (IC403) is defective or ARP & SERVO (IC301) is defective.

Center voltage → The XWAIT line has defective soldering or is short-circuited or AVD (IC403) is defective or ARP & SERVO (IC301) is defective or SYSCON (IC104) is defective.

• CSnX signal check

Observe CS0X to CS5X (pins-⑩⑪ to ⑩⑬) of SYSCON (IC104) with an oscilloscope.

If they are fixed to "L" (0V) or if to center voltage → Check that the ICs do not have the defective soldering or is shortcircuited with the other signal lines or SYSCON (IC104) is defective.

CS0X: ROM (IC106 or IC107)

CS2X, CS3X: AVD (IC403)

CS4X, CS5X: ARP & SERVO (IC301)

If the trouble symptom does not apply to any of the above phenomenon, SYSCON (IC104) or ROM (IC106 or IC107) is defective.

2. Test mode menu is displayed but the machine stops when menu is selected

2-1. AVD (IC403) check

Observe SDCLKO (pin-⑭) of AVD (IC403) with an oscilloscope.

95 MHz → No problem

27 MHz → Observe the XRST, HA, HD, XRD, XWRH, INT and CS signal waveform at the respective pins of AVDEC, AVD (IC403) is defective.

If the signal is other than the above frequencies → AVD (IC403) 27MHz signal line (CLKI (pin-⑮), SCLKIN (pin-⑯)) is short-circuited, IC mount is defective, AVD (IC403) is defective, PLL (IC103) is defective.

2-2. INT signal check

Observe INT0 to 2 (pins-⑯ to ⑰) of SYSCON (IC104) with an oscilloscope.

If they are fixed to "L" (0V) or fixed to the center voltage → Check that the ICs do not have the defective soldering, or are short-circuited, SYSCON (IC104) is defective, or the following ICs are not defective.

INT0: AVD (IC403)

INT1, INT2: ARP & SERVO (IC301)

2-3. If any abnormality cannot be confirmed by the above-described checks, check the CS signal that is currently output.

The CS signal other than CS0X is being output. → IC mount is defective or the IC is defective depending on the moving CS signal.

CS2X, CS3X: AVD (IC403)

CS4X, CS5X: ARP & SERVO (IC301)

If the trouble is not applicable to any of the above phenomenon, SYSCON (IC104) or ROM (IC106 or IC107) is defective.

3. If the message "SDSP No Ack" appears after the menu is displayed.

3-1. ARP & SERVO (IC301) clock signal check

Check frequency of CLKIN (pin-⑯⑰)

33 MHz → Normal

Frequency other than 33 MHz → CLKIN is short-circuited or defective soldering or PLL (IC103) is defective or ARP & SERVO (IC301) is defective

3-2. ARP & SERVO (IC301) PLL oscillation check

Observe PLCKO (pin-⑯⑰) of ARP & SERVO (IC301) with an oscilloscope.

If the pin is fixed to either "L" (0V) or "H" (3.3V).

If XRST is fixed to "L". XRST has the defective soldering, In all other cases. ARP & SERVO (IC301) is defective

If it is oscillating.

HA [0 to 7] are HD [8 to 15] are short-circuited, check XSDSPIT and XSDSPCS or ARP & SERVO (IC301) is defective.

4. If trouble occurs at the specific item of the "Diag All Check".

IC mount of the NG item is defective or IC is defective.

5. Picture and audio are not output.

Check connection of CN501, CN502 and CN601

Check for the defective connection of flat cable and check of damage of the flat cable.

6. Picture is output but audio is not output.

Check the audio data output (at pins-⑭, ⑮, and ⑯) of AVD (IC403)

The audio data is not output. → AVD (IC403) or audio DAC (IC502) mount is defective or power supply is defective or AVD (IC403) or audio DAC (IC502) is defective.

PLL (IC103) 512fs output check

If the frequency or waveform has abnormality. → The signal line has defective soldering or the signal line is short-circuited with other signal lines or PLL (IC103) is defective.

7. Audio is output but picture is not output.

Observe pins-⑯, ⑰, ⑲, ⑳ and ㉑ of VDAC (IC604) with an oscilloscope.

If the analog signal is not output. → The signal line has the defective soldering or is short-circuited or parts are defective or VDAC (IC604) is defective.

6-11-3. Drive Auto Adjustment stops due to error.

The ARP & SERVO (IC301) analog circuit of MB-110 board is defective or RF-Amp (IC201) or M-Driver (IC202) peripheral circuit is defective or optical pickup block is defective or flat cable connection is defective

6-11-4. The product itself is defective.

- If MB-110 does not have any problem,

The board other than MB-110 board is defective or connection is defective or optical pickup block is defective or mechanism deck is defective

1. FL display does not light when the POWER button is pressed.

1-1. Check the EVER -15V (pin-②), EVER +3.5V (pin-⑩), SW +3.3V (pin-⑦), EVER+11V (pin-⑫) voltage at CN201 of the power supply block

If voltage is abnormal. → The power supply block is defective.

1-2. Check if the fuse on the IF-103 board has blown or not.

If the fuse has blown → Replace the fuse.

1-3. Check the POWER CONTROL (pin-①) at CN471 of the IF-103 board when the POWER button is pressed.

If it remains at "L",

→ The signal line has the defective soldering or it is short-circuited with other signal lines or capacitor or resistor is defective or IFCON is defective or connection between the power supply block and the IF-103 board is defective, or connector installation is defective, or the power supply block is defective.

1-4. Check if the button is kept depressed in the IFCON self mode.

If the button is kept depressed. → The front panel is defective, or IF-103 board is defective.

1-5. Check PONCHK (pin-⑩) of IFCON (IC404) on the IF-103 board.

If it is 0.5 V or more. → The power supply is defective, or IF-103 board is defective.

1-6. Check ND401 (pin-① & pin-⑩) on the IF-103 board.

If no voltage supply → Voltage driver (IC407) defective, or the IF-103 board is defective.

2. FL display light once and becomes not light when POWER button is pressed.

2-1. Check CN201 voltage of the power supply block when the FL display light on.

If voltage is abnormal. → The power supply block is defective, or the IF-103 board is defective, or MB-110 is defective

2-2. Check XFRRST (pin-⑫) at CN103 on the MB-110 board.

If it is fixed to "L". → The signal line has defective soldering, or is short-circuited with other signal lines, or parts are defective.

2-3. Check XIFBSY (pin-⑭), XIFCS (pin-⑯), SI0 (pin-⑮), SO0 (pin-⑰) and SC0 (pin-⑲) at CN103

If they are fixed to "H" or "L".

→ The signal line has defective soldering, or is short-circuited with other signal line, or parts are defective, or SYSCON (IC104) is defective

If they change between "L/H".

Connector installation is defective, or the IF-103 board is defective, or SYSCON (IC104) is defective.

If they stay in the center voltage.

Poor connection of flexible wiring board such as it is inserted in an angle diagonally, or defective soldering, or is short-circuited with other signal line.

2-4. Check PONCHK (pin-⑩) of IFCON (IC404) on the IF-103 board.

If rise-up time from 0.5 V to 1.5 V or more takes longer time, or it does not exceed 1.5 V or more. → The IF-103 board is defective.

3. Both picture and audio are not output.

Connection between the power supply block and the IF-103 board is defective, or connection between the IF-103 board and the MB-110 board is defective, or connector installation is defective, or AV-74 board is defective.

4. Picture is not normal. (Block noise or others appear.)

The MB-110 board AVD (IC403) or SDRAM (IC404, IC405) is defective, or ARP & SERVO (IC301) is defective.

6-12. MECHANISM TEST MODE ADJUSTMENT

• Introduction

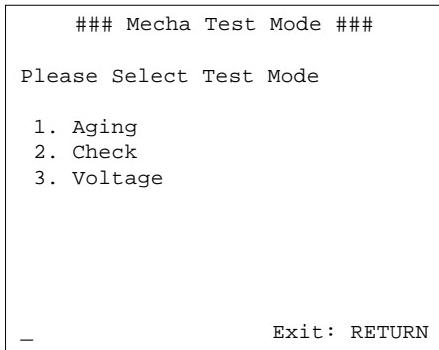
The mechanism test mode is designed for mechanism check. Do not use this mode for purposes other than the mechanism check.

6-12-1. How to enter the mechanism test mode

While the machine is in the standby mode, press the keys on the remote commander in the order starting from [TOP MENU] → [CLEAR] → [I/O] to enter the remote commander service mode. Then press the numeric key [3] and select “3. Mecha Test Mode”.

6-12-2. Types of the mechanism test mode

When you enter the mechanism test mode, the following menu appears.



Press the desired numeric number on the display. Then you enter the selected mode.

When “1. Aging” is selected, you enter the mechanism aging mode.
When “2. Check” is selected, you enter the mechanism check mode.
When “3. Voltage” is selected, you enter the voltage check mode.

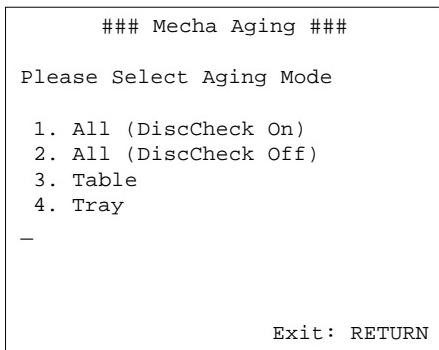
6-12-3. Description of Each Mode

3-1. Mechanism aging mode

This is the aging mode for mechanism. When this mode is selected, the mechanism is initialized first.

3-1-1. Selection of aging mode

When initialization is completed, the following menu appears. Select the desired aging mode from the following menu.



When you select the desired numeric number on display, the corresponding aging mode will be selected.

• “1. All (DiscCheck On)”

This is the overall aging mode (with disc check).

Contents of the aging operations are as follows. Table and tray are moved in the following sequence: TableClose (DiscNumber Random) → ChuckUp → DiscCheck → TableEx Open → TrayExMove (Left → Right) → TableExClose → ChuckDown → TableOpen. A series of operation as described above is called as one full count, and is repeated.

• “2. All (DiscCheck Off)”

This is the overall aging mode (without disc check).

Contents of the aging operations are as follows. Table and tray are moved in the following sequence: TableClose(DiscNumber Random) → ChuckUp → TableExOpen → TrayExMove(Left → Right) → TableExClose → ChuckDown → TableOpen. A series of operation as described above is called as one full count, and is repeated.

• “3. Table”

This is the table aging mode.

Contents of the aging operations are as follows. Table is rotated in the following sequence: TableClose(Tray NoMove) → ChuckUp → TableExOpen → TableExClose → ChuckDown → TableOpen. A series of operation as described above is called as one full count, and is repeated.

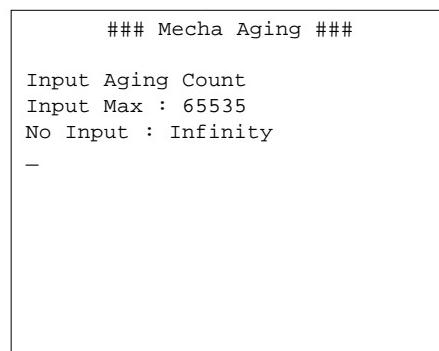
• “4. Tray”

This is the tray aging mode.

Contents of the aging operations are as follows. Tray is rotated one full turn in the clockwise direction and is rotated one full turn in the counterclockwise direction. One full rotation of tray is called as one full count, and is repeated. The disc number is reduced by one after every 20 counts.

3-1-2. Setting number of times of aging

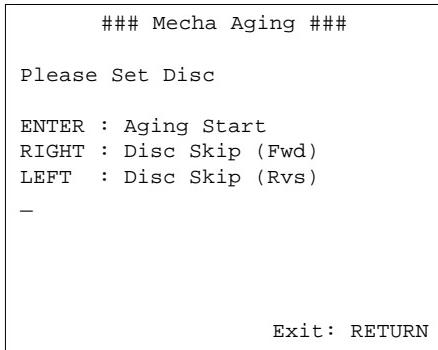
When aging mode is selected, the following menu appears. Set the number of times of aging in this menu.



Use the numeric keys to enter the desired number. Then press [ENTER] to set the number. If you press [ENTER] without entering any number, the number of times of aging becomes infinite.

3-1-3. Setting disc

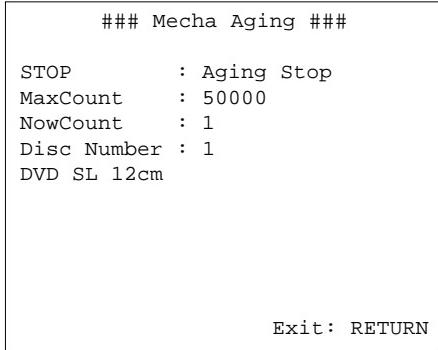
When the number of times of aging is set, the table is opened and the following menu appears. Set a test disc while the following menu is displayed.



When you press **[RIGHT]**, the tray moves in the direction of Disc Number +1. When you press **[LEFT]**, the tray moves in the direction of Disc Number -1. Press **[ENTER]** to start aging.

3-1-4. While aging is in progress

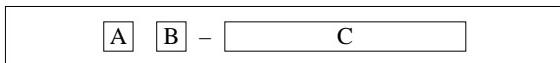
While aging is in progress, the following screen appears.



Max Count indicates the number of times of aging. Now Count indicates the present number of times of aging. Disc Number indicates the disc number of the present chucking position.

The indication "DVD SL 12cm" under the Disc Number indicates the disc type when disc check is performed.

In addition to it, the following contents are displayed on the FL display tube.



"A" indicates the aging mode.

- 1: All (DiscCheck On)
- 2: All (DiscCheck Off)
- 3: Table
- 4: Tray

"B" indicates the aging operation. (Disc number is displayed during the Tray aging mode.)

- 1: Table Close
- 2: Chuck Up
- 3: DiscCheck
- 4: Table ExOpen
- 5: Tray ExMove
- 6: Table ExClose
- 7: Chuck Down
- 8: Table Open

"C" indicates the number of times of aging.

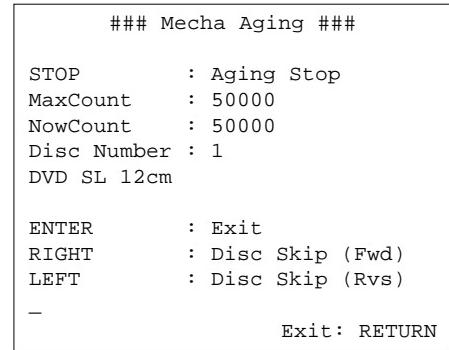
If you press **[STOP]** or **[RETURN]** during aging, the aging operation is terminated. If you press **[PAUSE]** during aging, the aging operation is paused. Pressing any key resumes the aging operation.

3-1-5. Terminating the aging operation

The aging operation terminates when the following conditions are satisfied.

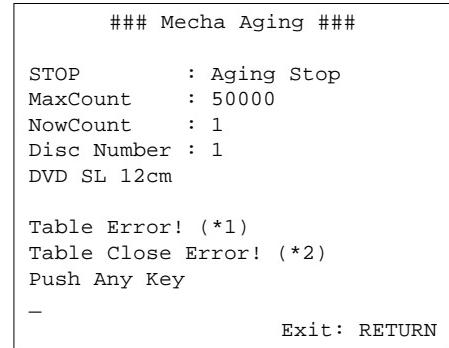
- The aging is performed for the set number of times.
- The aging is terminated as **[STOP]** or **[RETURN]** is pressed.
- An abnormality occurs in mechanism.

When the aging operation ends normally, table is opened and the following menu appears.



When you press **[RIGHT]**, the tray moves in the direction of Disc Number +1. When you press **[LEFT]**, the tray moves in the direction of Disc Number -1. Press **[ENTER]** to terminate the aging mode after tray is closed and chucked.

If any abnormality occurs during the aging mode, the aging operation is stopped and the following menu appears.

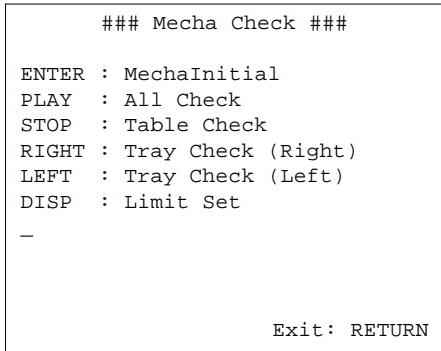


*1 indicates the mechanical part where error occurs.

*2 shows the mode when error occurs.

3-2. Mecha Check Mode

This is the mode called "Mecha Check" that checks if the mechanical loads to the mechanism is within the allowable range or not. For the table, the operating time in each mode is measured for judgment. For the tray, the time of guide slit is measured for judgment. When the "Mecha Check" mode is selected, the following menu appears.



3-2-1. Operation contents

Operation contents of each mode are described below.

• ENTER: MechaInitial

It initializes the mechanism. If the mechanism is not initialized, pressing any buttons of either (STOP) or or activates no operations. In such a case, initialize the mechanism by executing this command.

• PLAY: All Check

Both of the table and tray are checked in this mode. Operation check is performed in the following order starting from MechaInitial → ChuckUp → TableExOpen → TableExClose → ChuckDown → TableOpen → TableClose → TrayRightTurn → TrayLeftTurn. Disc sensor is also check at the same time. If a single disc is present on the tray, OK is judged. In all other cases, NG is judged.

• STOP: Table Check

Table is checked. Operation check is performed in the following order starting from ChuckUp → TableExOpen → TableExClose → ChuckDown → TableOpen → TableClose.

• RIGHT: Tray Check (Right)

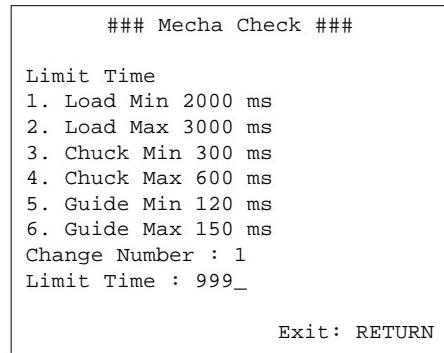
Tray is checked. The tray is rotated by full turn in the clockwise direction.

• LEFT: Tray Check (Left)

Tray is checked. The tray is rotated by full turn in the counter-clockwise direction.

• DISP: Limit Set

It sets the limit value of each check. When is pressed, the following menu appears.



Each item has the following meaning.

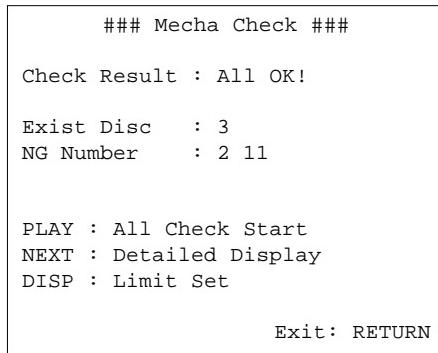
- LoadMin : Lower limit of operating time between TableOpen-TableClose and between TableExOpen-TableExClose
- LoadMax : Upper limit of operating time between TableOpen-TableClose and between TableExOpen-TableExClose.
- ChuckMin : Lower limit of operating time between ChuckUp-ChuckDown.
- ChuckMax : Upper limit of operating time between ChuckUp-ChuckDown.
- GuideMin : Lower limit of the passing time over the guide slit.
- GuideMax : Upper limit of the passing time over the guide slit.

To change the limit value, select the desired item number by enter the number from the keyboard. Then enter the data to set. The data up to 9999 can be entered. If you press (RETURN) or when entering the item number, the display returns to the previous menu.

3-2-2. Result display

① AllCheck result display

When AllCheck is completed, the following display appears.



• Check Result

When the test result is all OK, the message "AllOK!" appears. If any item is found defective, "NG!" is displayed. The conditions to show NG are shown below.

- "Operation time has exceeded either upper limit or lower limit."
- "Disc is not inserted or 2 or more discs are detected."
- "Either tray or table does not move."

• Exist Disc

The number where disc is located, is shown.

• NG Number

This message appears when the test result is NG. The displayed numbers correspond to the following operations.

Table

- 1: Open → Down
- 2: Down → Open
- 3: Up → ExOpen
- 4: ExOpen → Up
- 5: Up → Down
- 6: Down → Up

Tray (DiscNumber)

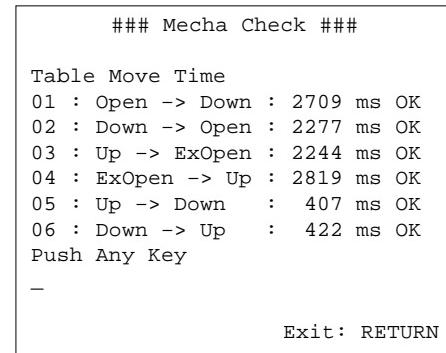
- | | |
|-----------|-----------|
| 11: 1 → 2 | 21: 1 → 5 |
| 12: 2 → 3 | 22: 5 → 4 |
| 13: 3 → 4 | 23: 4 → 3 |
| 14: 4 → 5 | 24: 3 → 2 |
| 15: 5 → 1 | 25: 2 → 1 |

If any of the following buttons is pressed while this display is being shown, the following operations start.

- When [▶] (PLAY) is pressed, AllCheck starts.
- When [▶▶] (NEXT) is pressed, details of measurement result are displayed.
- When [DISPLAY] is pressed, the limit setting menu appears.
- When any other key is pressed, the display returns to the main menu.

② TableCheck result display

When table check is completed, the following display appears.

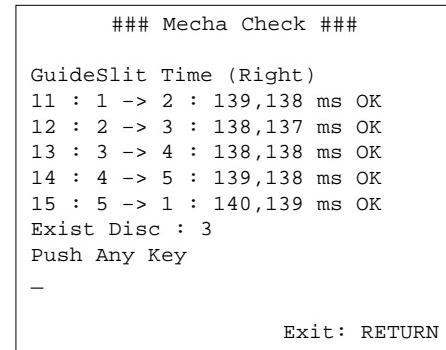


The operation time between each operation segments is displayed (in unit of ms). In the right of the time display, judgment if the time is OK or NG is displayed. This judgment of OK or NG is displayed on the FL display tube. If the remote commander **[↑]** or **[↓]** key is pressed, results of measurement of each operation segment are displayed on FL display.

When **[▶]** (NEXT) is pressed during AllCheck, result of the next measurement is displayed. When **[◀]** (PREV) is pressed during AllCheck, result of the previous measurement is displayed. If any other key is pressed, display returns to the main menu.
In the TableCheck mode, if any key is pressed, display returns to the main menu.

③ TrayCheck (Right) result display

After tray check is completed by rotating it in clockwise direction, the following display appears.

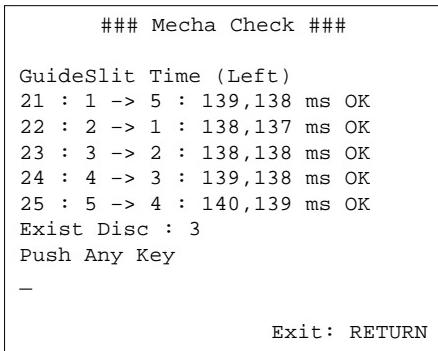


The guide slit time (in units of ms) of each operation segment of tray is displayed. In the right of the time display, judgment if the time is OK or NG is displayed. The ExistDisc indicates the number where disc is located. This judgment of OK or NG is displayed on the FL display tube. If the remote commander **[↑]** or **[↓]** key is pressed, results of measurement of each operation segment are displayed on FL display.

When **[▶]** (NEXT) is pressed, result of the next measurement is displayed. When **[◀]** (PREV) is pressed, result of the previous measurement is displayed. If any other key is pressed, display returns to the main menu.
In the TrayCheck mode, if any key is pressed, display returns to the main menu.

④ TrayCheck (Left) result display

After tray check is completed by rotating it in the counterclockwise direction, the following display appears.



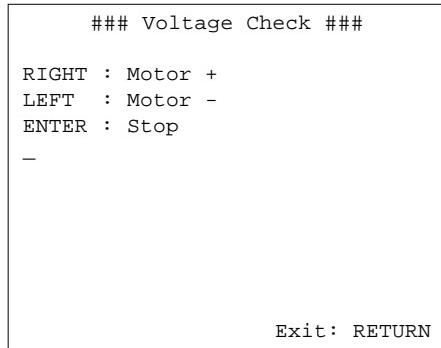
The guide slit time (in units of ms) of each operation segment of tray is displayed. In the right of the time display, judgment if the time is OK or NG is displayed. The ExistDisc indicates the number where disc is located. This judgment of OK or NG is displayed on the FL display tube. If the remote commander **[↑]** or **[↓]** key is pressed, results of measurement of each operation segment are displayed on FL display.

When **[▶]** (NEXT) is pressed, result of the next measurement is displayed. When **[◀]** (PREV) is pressed, result of the previous measurement is displayed. If any other key is pressed, display returns to the main menu.

In the TrayCheck mode, if any key is pressed, display returns to the main menu.

3-3. Voltage Check Mode

This mode checks the drive voltages of tray and table. Because the full drive voltage is applied to each motor in this mode, do not execute this mode while the mechanism is being connected. When this mode is selected, the following menu appears.



When **[▷]** (PLAY) is pressed, AllCheck starts.

When **[■]** is pressed, the positive (+) voltage is applied to the motors of tray and table.

When **[□]** is pressed, the negative (-) voltage is applied to the motors of tray and table.

When **[ENTER]** is pressed, voltage is stopped to be applied to the motors of tray and table.

Press **[○]** (RETURN) to exit this mode.

SECTION 7

ELECTRICAL ADJUSTMENT

In making adjustment, refer to 7-5. Adjustment Related Parts Arrangement.

This section describes procedures and instructions necessary for adjusting electrical circuits in this unit.

Instruments required:

- 1) Color monitor TV
- 2) Oscilloscope 1 or 2 phenomena, band width over 100 MHz, with delay mode
- 3) Frequency counter (over 8 digits)
- 4) Digital voltmeter
- 5) Standard commander (RMT-D159A)
- 6) DVD reference disc
HLX-501 (J-6090-071-A) (dual layer) (NTSC)
HLX-503 (J-6090-069-A) (single layer) (NTSC)
HLX-504 (J-6090-088-A) (single layer) (NTSC)
HLX-505 (J-6090-089-A) (dual layer) (NTSC)
- 7) SACD reference disc
HLXA-509 (J-6090-090-A)
- 8) Extension Cable (J-6090-107-A)

7-1. POWER SUPPLY CHECK

1. SRV1439UC Board

Mode	E-E
Instrument	Digital voltmeter
EVER +3.5 V Check	
Test point	CN201 pin ⑩
Specification	3.5 ± 0.2 Vdc
SW +3.3 V Check	
Test point	CN201 pin ⑦
Specification	3.5 ± 0.2 Vdc
SW +5 V Check	
Test point	CN201 pin ⑪
Specification	5.0 ± 0.3 Vdc
SW +11 V Check	
Test point	CN201 pin ⑤, ⑥
Specification	11.0 ± 1.0 Vdc
EVER +11 V Check	
Test point	CN201 pin ⑫
Specification	11.2 ± 1.0 Vdc
EVER -15 V Check	
Test point	CN201 pin ②
Specification	-15.0 ± 1.0 Vdc

Checking method:

- 1) Confirm that each voltage satisfies the specification.

Note

Because the heatsink installed on the power supply board is a part of the primary side, never touch it to avoid electrical shock.

7-2. ADJUSTMENT OF VIDEO SYSTEM

1. Video Level Adjustment (MB-110 Board)

<Purpose>

This adjustment is made to satisfy the NTSC standard, and if not adjusted correctly, the brightness will be too large or small.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	LINE OUT (VIDEO) connector (75 Ω terminated)
Instrument	Oscilloscope
Adjusting element	RV601
Specification	1.0 ± 0.04 Vp-p

Adjusting method:

- 1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
- 2) Adjust the RV601 to attain 1.0 ± 0.04 Vp-p.



Fig. 7-1

2. Progressive Video Output Level Adjustment (MB-110 Board)

<Purpose>

This adjusts progressive video output level. If it is incorrect, correct brightness will not be attained when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Adjusting element	RV602
Specification	1.0 ± 0.04 Vp-p

Adjusting method:

- 1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
- 2) Adjust the RV602 to attain 1.0 ± 0.04 Vp-p.



Fig. 7-2

3. Checking S Video Output S-Y

<Purpose>

Check S-terminal video output. If it is incorrect, pictures will not be displayed correctly in spite of connection to the TV with a S-terminal cable.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.05 Vp-p

Checking method:

- 1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
- 2) Confirm that the S-Y level is 1.0 ± 0.05 Vp-p.



Fig. 7-3

4. Checking S Video Output S-C

<Purpose>

This checks whether the S-C satisfies the NTSC standard. If it is not correct, the colors will be too dark or light.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-C) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	$A = 286 \pm 30$ mVp-p (NTSC)

Checking method:

- 1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
- 2) Confirm that the S-C burst is “A”.



Fig. 7-4

5. Checking Component Video Output Y

<Purpose>

This checks component video output Y. If it is incorrect, correct brightness will not be attained when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (Y) connector (75Ω terminated)
Instrument	Oscilloscope
Specification	$1.0 \pm 0.05 \text{ Vp-p}$

Checking method:

- 1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
- 2) Confirm that the Y level is $1.0 \pm 0.05 \text{ Vp-p}$.



Fig. 7-5

6. Checking Component Video Output B-Y

<Purpose>

This checks component video output B-Y. If it is incorrect, correct colors will not be displayed when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (P _B) connector (75Ω terminated)
Instrument	Oscilloscope
Specification	$A = 646 \pm 50 \text{ mVp-p}$

Checking method:

- 1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
- 2) Confirm that the B-Y level is A.

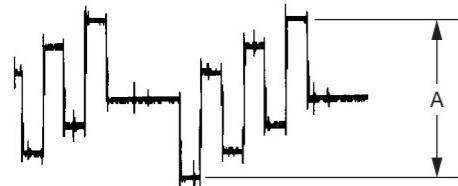


Fig. 7-6

7. Checking Component Video Output R-Y

<Purpose>

This checks component video output R-Y. If it is incorrect, correct colors will not be displayed when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (P _R) connector (75Ω terminated)
Instrument	Oscilloscope
Specification	$B = 646 \pm 50 \text{ mVp-p}$

Checking method:

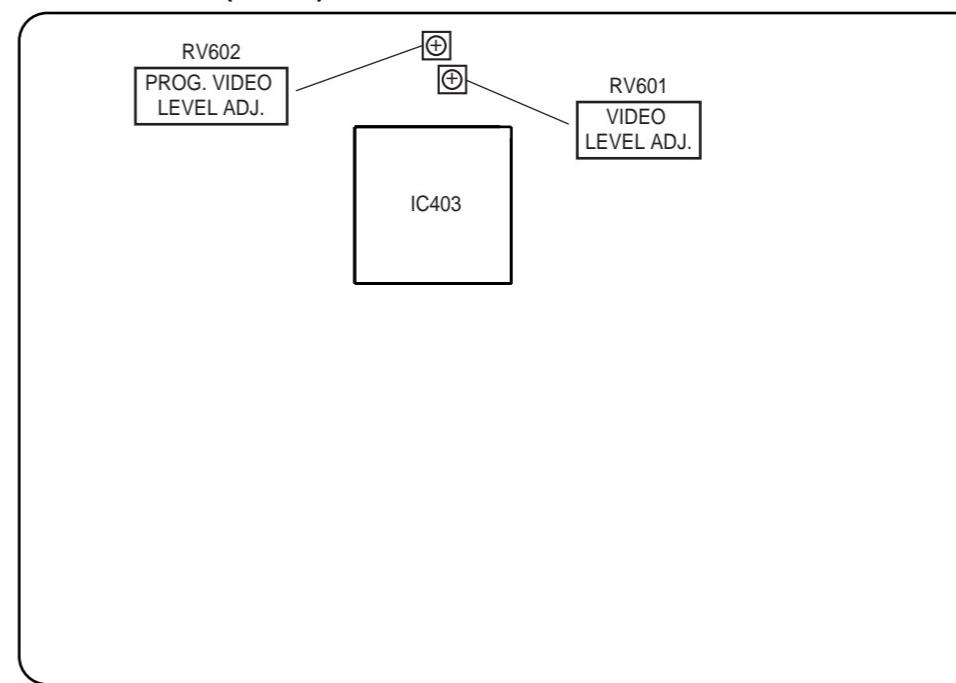
- 1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
- 2) Confirm that the R-Y level is B.



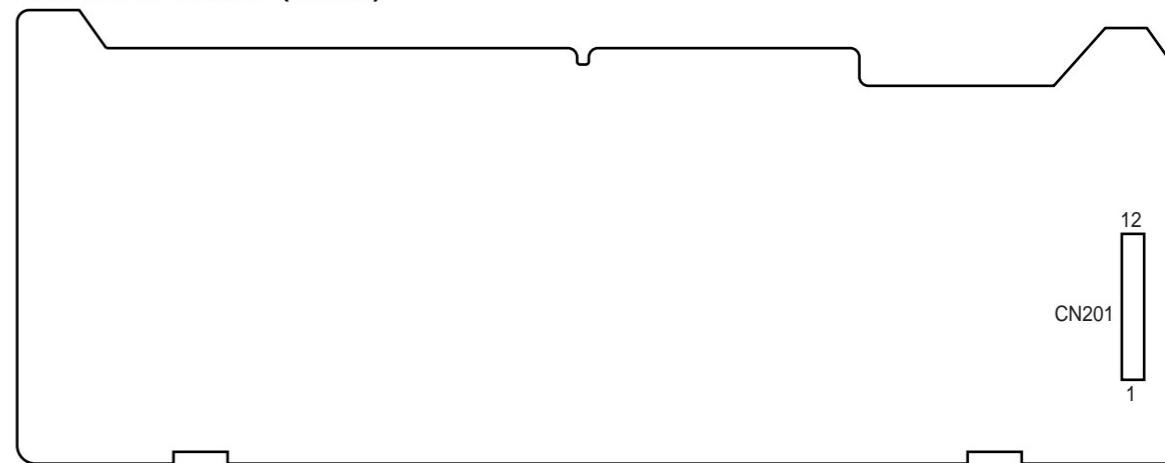
Fig. 7-7

7-3. ADJUSTMENT RELATED PARTS ARRANGEMENT

MB-110 BOARD (Side A)



SRV1439UC BOARD (Side A)



SECTION 8

REPAIR PARTS LIST

8-1. EXPLODED VIEWS

NOTE:

- XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts

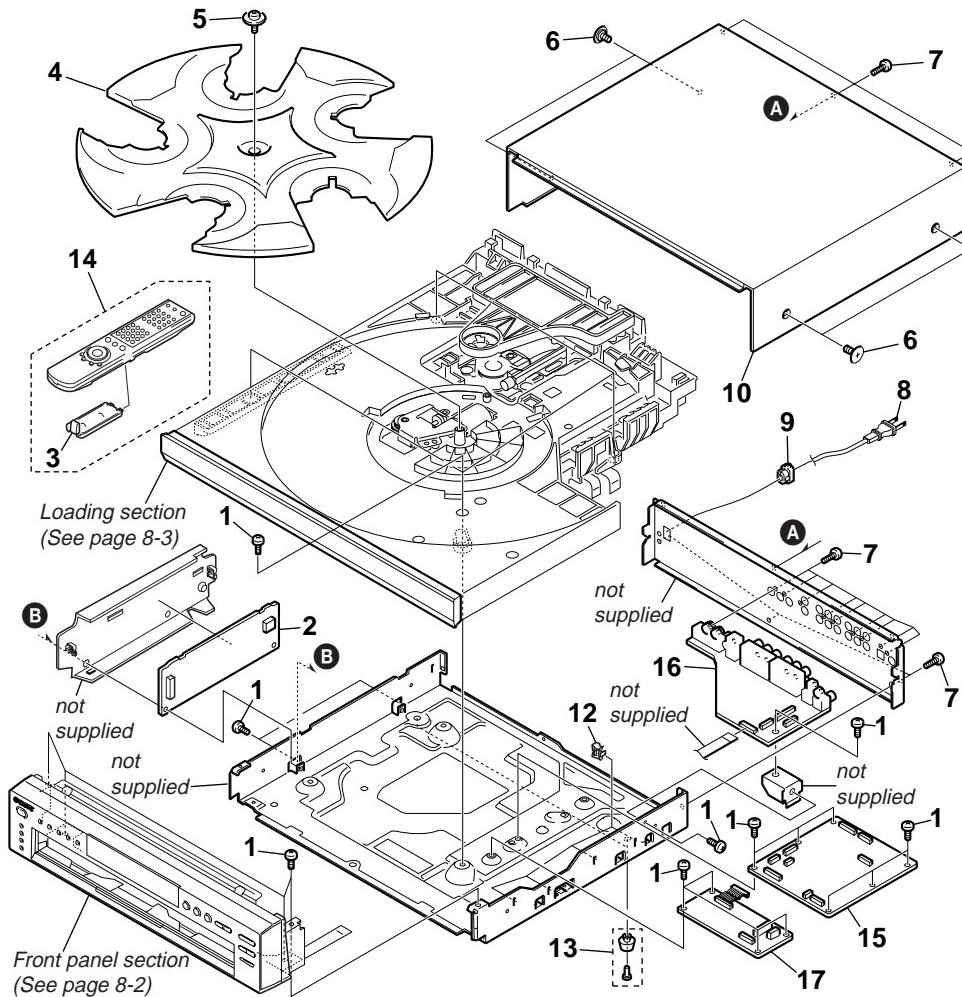
Example:

KNOB, BALANCE (WHITE) . . . (RED)
 ↑ ↑
 Parts Color Cabinet's Color

- Items marked “**” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

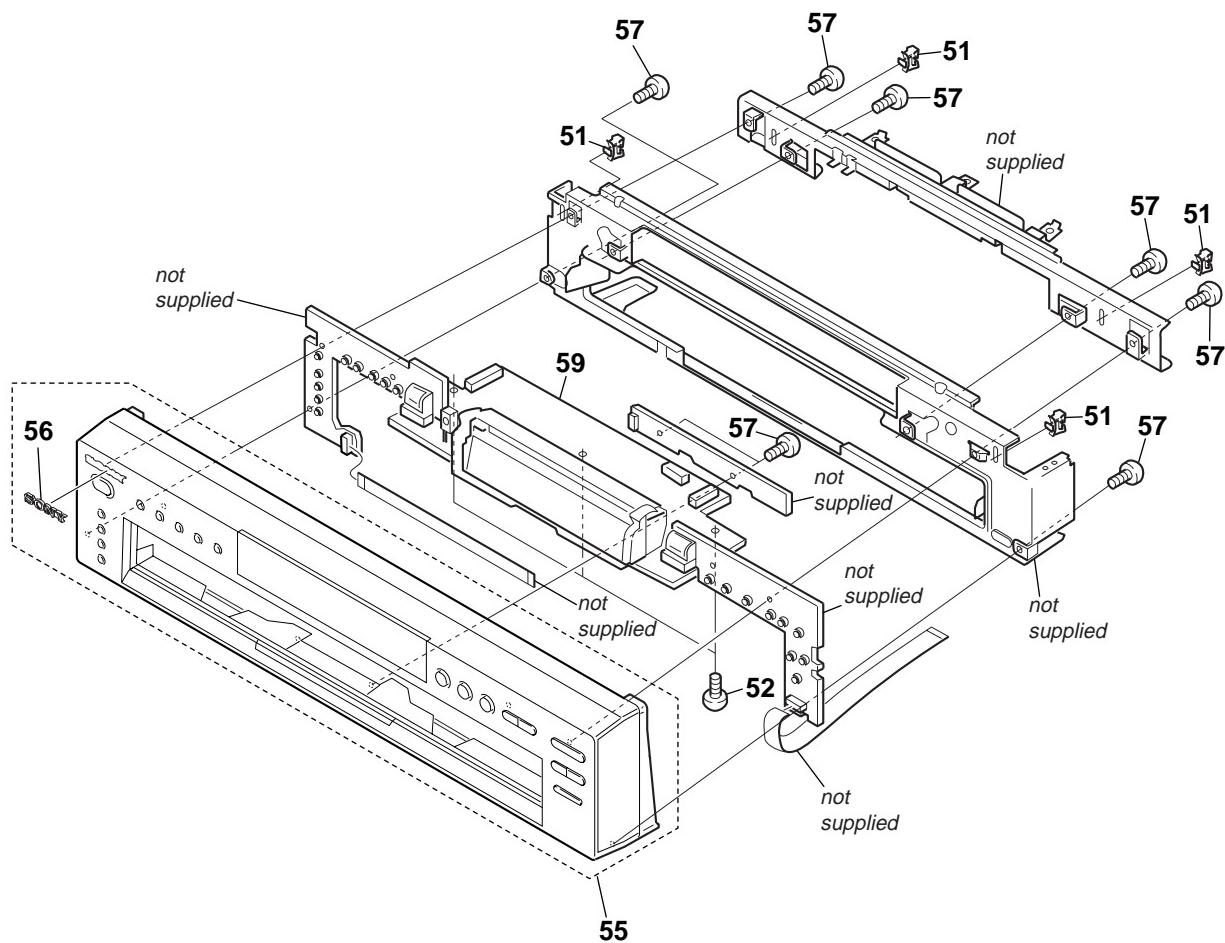
The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

8-1-1. OVERALL SECTION



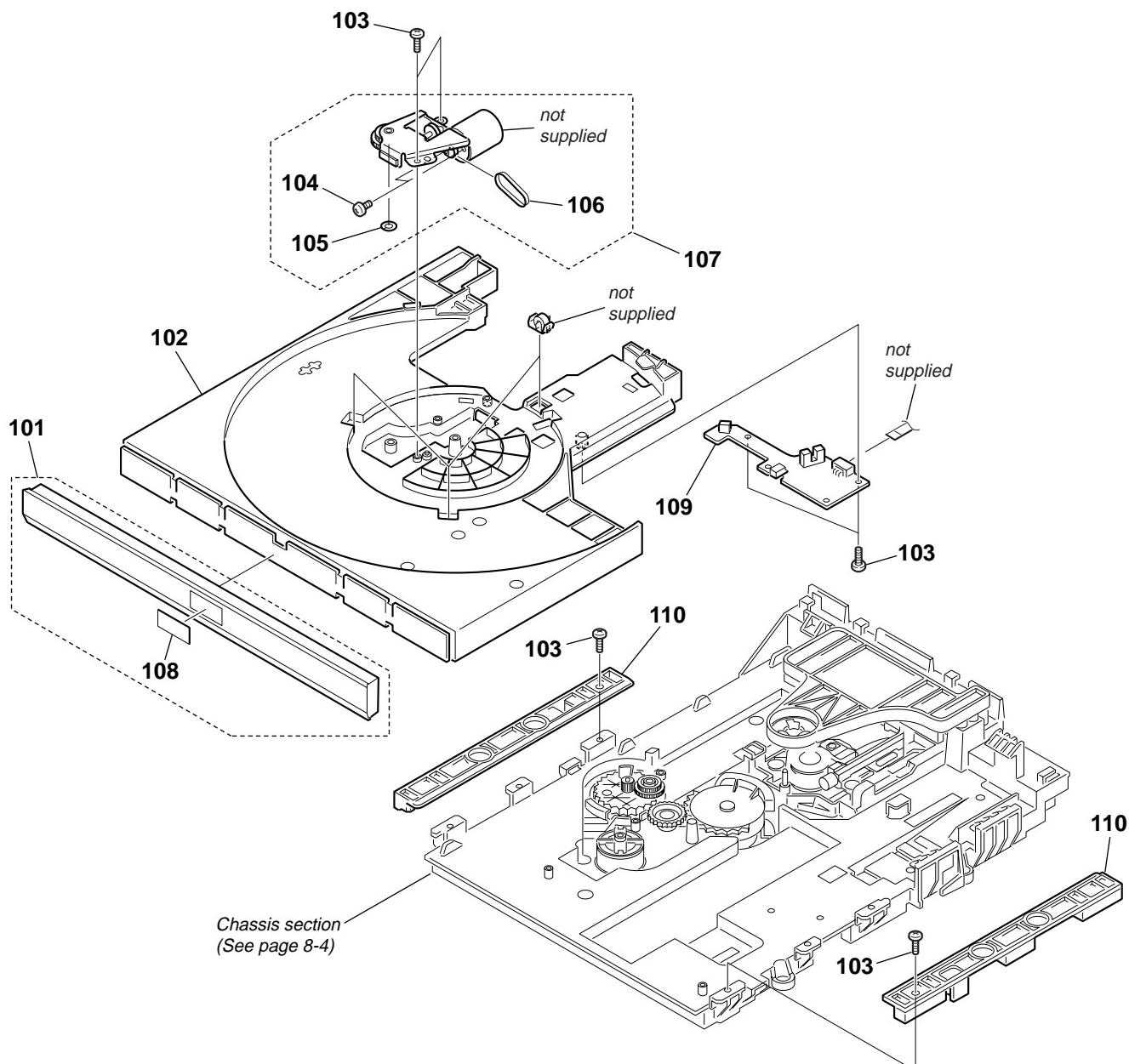
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-970-608-01	SUMITITE (B3), +BV		10	3-079-683-51	CASE, UPPER	
\triangle 2	1-468-765-12	POWER BLOCK		11	3-831-441-11	CUSHION (F)	
3	3-073-096-01	COVER, BATTERY (for RMT-D159A)		* 12	3-633-259-01	SADDLE, RE-USE WIRE	
4	3-074-717-01	TRAY		13	3-957-819-01	FOOT	
5	4-218-252-51	SCREW (+PTPWH M2.6), FLOATING		14	1-478-015-11	REMOTE COMMANDER (RMT-D159A)	
6	3-070-883-01	SCREW, TAPPING		15	A-6061-917-A	MB-110 BOARD, COMPLETE	
7	3-970-608-51	SUMITITE (B3), +BV		16	A-6061-919-A	AV-74 BOARD, COMPLETE	
\triangle 8	1-783-532-32	CORD, POWER		17	A-6061-925-A	DV-35 BOARD, COMPLETE	
9	3-073-182-02	BUSHING, CODE					

8-1-2. FRONT PANEL SECTION



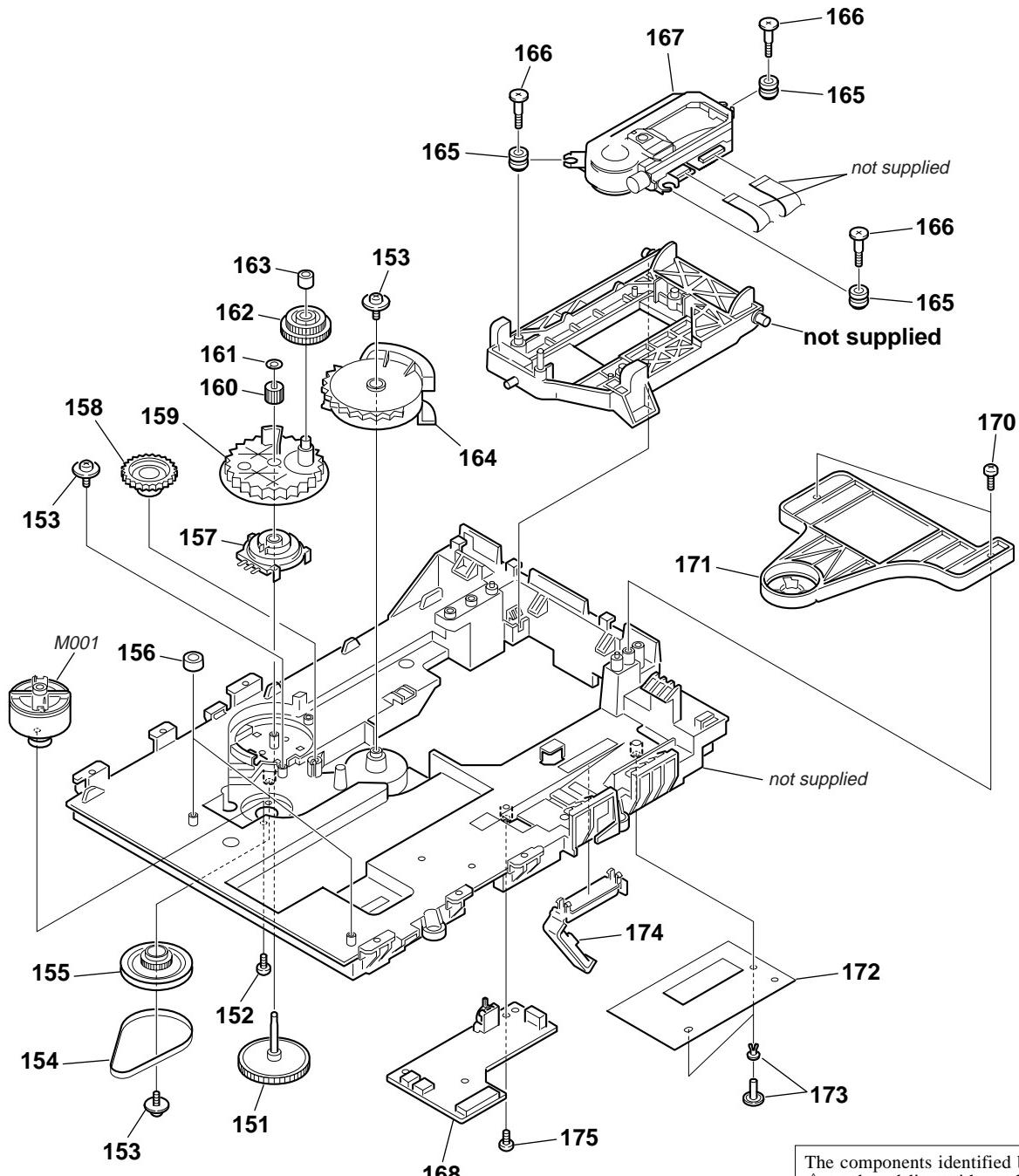
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 51	3-633-259-01	SADDLE, RE-USE WIRE		56	3-943-995-01	EMBLEM (NO.5), SONY	
52	3-970-608-01	SUMITITE (B3), +BV		57	4-951-620-01	SCREW (2.6X8), +BVTP	
55	X-3953-425-1	PANEL ASSY, FRONT (SP)		59	A-6061-921-A	IF-103 BOARD, COMPLETE	

8-1-3. LOADING SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	X-3953-136-1	COVER ASSY, TRAY		106	3-074-725-01	BELT, TD	
102	3-074-716-01	TABLE		107	A-6060-640-A	UNIT ASSY, TD	
103	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S		108	3-067-237-01	EMBLEM (V), DVD	
104	7-682-544-04	SCREW +P 3X3		109	A-6060-642-A	SE-130 BOARD, COMPLETE	
105	3-325-697-21	WASHER		110	3-074-737-01	PLATE (GUIDE)	

8-1-4. CHASSIS SECTION



The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	3-074-742-01	GEAR (SHAFT)		164	3-074-736-01	GEAR (CHUCK)	
152	7-621-259-25	SCREW +P 2.6X4		165	3-053-847-11	INSULATOR	
153	4-218-252-51	SCREW (+PTPWH M2.6), FLOATING		166	3-074-729-01	SCREW, INS	
154	3-074-745-01	BELT (LOADING)		\triangle 167	A-6061-908-A	KHM-290AAA SERVICE ASSY	
155	3-074-744-01	GEAR (LOADING A)		168	A-6060-643-A	MD-94 BOARD, COMPLETE	
156	4-951-619-01	CUSHION (A)		170	3-970-608-51	SUMITITE (B3), +BV	
157	X-3952-380-1	ENCODER ASSY		171	A-6060-647-B	CHUCK ASSY	
158	3-074-735-01	GEAR (IDOLER)		172	3-074-731-01	SHEET (FFC)	
159	3-074-738-01	GEAR (SWING)		173	3-531-576-11	RIVET	
160	3-074-741-01	GEAR (LOADING B)		174	3-074-747-01	CLAMP (FFC)	
161	3-016-533-01	WASHER (FR), STOPPER		175	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S	
162	3-074-740-01	GEAR (LOADING C)		M001	X-3952-378-1	MOTOR ASSY, LOADING	
163	3-074-739-01	COLLAR (SWING)					

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable
- Not all of the parts for POWER BLOCK (SRV1439UC) are listed.

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

• SEMICONDUCTORS

In each case, u: μ , for example:
uA... : μ A... uPA... : μ PA...
uPB... : μ PB... uPC... : μ PC...
uPD... : μ PD...

• CAPACITORS

uF: μ F

• COILS

uH: μ H

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark		Ref. No.	Part No.	Description	Remark					
A-6061-919-A AV-74 BOARD, COMPLETE						C254	1-115-416-11	CERAMIC CHIP	0.001uF	5%			
***** (Ref. No. 1,000 Series)													
<i>< CAPACITOR ></i>													
C105	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	C256	1-115-414-11	CERAMIC CHIP	820PF	5%			
C106	1-126-947-11	ELECT	47uF	20%	16V	C257	1-115-414-11	CERAMIC CHIP	820PF	5%			
C107	1-126-947-11	ELECT	47uF	20%	16V	C258	1-115-414-11	CERAMIC CHIP	820PF	5%			
C108	1-126-947-11	ELECT	47uF	20%	16V	C259	1-115-414-11	CERAMIC CHIP	820PF	5%			
C109	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	C260	1-163-133-00	CERAMIC CHIP	470PF	5%			
C110	1-126-947-11	ELECT	47uF	20%	16V	C263	1-163-133-00	CERAMIC CHIP	470PF	5%			
C111	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	C266	1-163-133-00	CERAMIC CHIP	470PF	5%			
C112	1-126-947-11	ELECT	47uF	20%	16V	C270	1-163-133-00	CERAMIC CHIP	470PF	5%			
C113	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	C272	1-163-133-00	CERAMIC CHIP	470PF	5%			
C201	1-126-935-11	ELECT	470uF	20%	16V	C275	1-126-947-11	ELECT	47uF	20%			
C202	1-126-960-11	ELECT	1uF	20%	50V	C276	1-126-947-11	ELECT	47uF	20%			
C208	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C277	1-126-947-11	ELECT	47uF	20%			
C209	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C301	1-126-947-11	ELECT	47uF	20%			
C210	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C311	1-162-970-11	CERAMIC CHIP	0.01uF	10%			
C214	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C314	1-107-826-11	CERAMIC CHIP	0.1uF	10%			
C215	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C316	1-162-970-11	CERAMIC CHIP	0.01uF	10%			
C216	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C317	1-162-970-11	CERAMIC CHIP	0.01uF	10%			
C219	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C322	1-126-960-11	ELECT	1uF	20%			
C220	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C333	1-115-414-11	CERAMIC CHIP	820PF	5%			
C221	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C334	1-115-414-11	CERAMIC CHIP	820PF	5%			
C222	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C335	1-163-133-00	CERAMIC CHIP	470PF	5%			
C223	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C336	1-163-133-00	CERAMIC CHIP	470PF	5%			
C224	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C337	1-163-133-00	CERAMIC CHIP	470PF	5%			
C235	1-126-947-11	ELECT	47uF	20%	16V	C338	1-163-133-00	CERAMIC CHIP	470PF	5%			
C236	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C339	1-163-133-00	CERAMIC CHIP	470PF	5%			
C237	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C340	1-163-133-00	CERAMIC CHIP	470PF	5%			
C238	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C346	1-126-935-11	ELECT	470uF	20%			
C238	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	C348	1-126-947-11	ELECT	47uF	20%			
C239	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C349	1-126-947-11	ELECT	47uF	20%			
C240	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C350	1-126-947-11	ELECT	47uF	20%			
C241	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C353	1-126-947-11	ELECT	47uF	20%			
C242	1-126-947-11	ELECT	47uF	20%	16V	C354	1-162-927-11	CERAMIC CHIP	100PF	5%			
C248	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	C355	1-162-927-11	CERAMIC CHIP	100PF	5%			
C249	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	C356	1-126-947-11	ELECT	47uF	20%			
C250	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	C357	1-126-947-11	ELECT	47uF	20%			
<i>< CONNECTOR ></i>													
C251	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	CN101	1-816-220-21	CONNECTOR, FFC/FPC 11P					
C252	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	L CN201	1-817-097-91	PIN, CONNECTOR (1.5MM) (SMD)13P					
C253	1-126-947-11	ELECT	47uF	20%	16V								

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
CN302	1-766-382-91	PIN, CONNECTOR 10P		R103	1-216-061-91	RES-CHIP	3.3K 5% 1/10W
CN303	1-764-177-91	PIN, CONNECTOR 7P		R108	1-216-073-91	RES-CHIP	10K 5% 1/10W
< DIODE >							
D101	8-719-071-15	DIODE HZM6.8ZWA1TL		R111	1-216-021-00	METAL CHIP	68 5% 1/10W
D102	8-719-071-15	DIODE HZM6.8ZWA1TL		R112	1-216-021-00	METAL CHIP	68 5% 1/10W
D106	8-719-071-15	DIODE HZM6.8ZWA1TL		R113	1-216-021-00	METAL CHIP	68 5% 1/10W
D107	8-719-071-15	DIODE HZM6.8ZWA1TL		R114	1-216-021-00	METAL CHIP	68 5% 1/10W
D108	8-719-053-18	DIODE 1SR154-400TE-25		R115	1-216-021-00	METAL CHIP	68 5% 1/10W
D109	8-719-053-18	DIODE 1SR154-400TE-25		R116	1-216-021-00	METAL CHIP	68 5% 1/10W
D301	8-719-988-61	DIODE 1SS355TE-17		R117	1-216-021-00	METAL CHIP	68 5% 1/10W
D303	8-719-914-43	DIODE DAN202K-T-146		△R140	1-215-860-11	METAL OXIDE	33 5% 1W
< IC >							
IC102	8-759-662-86	IC NJM79M05DL1A (TE2)		△R141	1-215-860-11	METAL OXIDE	33 5% 1W
IC103	6-701-820-01	IC LA73053-TLM-E		R201	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
IC201	8-759-909-71	IC BA4558F-E2		R202	1-216-073-91	RES-CHIP	10K 5% 1/10W
IC202	8-759-909-71	IC BA4558F-E2		R203	1-216-073-91	RES-CHIP	10K 5% 1/10W
IC203	8-759-909-71	IC BA4558F-E2		R204	1-216-089-91	RES-CHIP	47K 5% 1/10W
IC301	6-600-185-01	IC GP1FA553TZOF (DIGITAL OUT OPTICAL)		R205	1-216-073-91	RES-CHIP	10K 5% 1/10W
IC302	8-759-052-52	IC NJM78M05DL1A-TE1		R206	1-216-649-11	METAL CHIP	820 0.5% 1/10W
IC303	8-759-909-71	IC BA4558F-E2		R207	1-216-649-11	METAL CHIP	820 0.5% 1/10W
< JACK >							
J101	1-694-484-21	TERMINAL, S (2P.V) (S VIDEO OUT)		R208	1-216-649-11	METAL CHIP	820 0.5% 1/10W
J102	1-815-362-21	JACK, PIN (6P) (LINE OUT AUDIO/VIDEO)		R209	1-216-649-11	METAL CHIP	820 0.5% 1/10W
J103	1-793-445-11	JACK, PIN 3P (COMPONENT VIDEO OUT)		R210	1-216-649-11	METAL CHIP	820 0.5% 1/10W
J201	1-815-029-21	JACK, PIN 6P (5.1CH OUTPUT)		R211	1-216-649-11	METAL CHIP	820 0.5% 1/10W
J301	1-793-446-21	JACK, PIN 1P (DIGITAL OUT COAXIAL)		R212	1-216-649-11	METAL CHIP	820 0.5% 1/10W
< COIL >							
L101	1-412-060-11	INDUCTOR	22uH	R213	1-216-649-11	METAL CHIP	820 0.5% 1/10W
L301	1-412-064-11	INDUCTOR	100uH	R214	1-216-649-11	METAL CHIP	820 0.5% 1/10W
< TRANSISTOR >							
Q104	8-729-421-19	TRANSISTOR UN2213-TX		R215	1-216-649-11	METAL CHIP	820 0.5% 1/10W
Q105	8-729-424-08	TRANSISTOR UN2111-TX		R216	1-216-049-11	RES-CHIP	1K 5% 1/10W
Q201	8-729-421-19	TRANSISTOR UN2213-TX		R217	1-216-049-11	RES-CHIP	1K 5% 1/10W
Q202	8-729-424-70	TRANSISTOR UN2217-TX		R218	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q203	8-729-424-02	TRANSISTOR 2SB709A-QRS-TX		R219	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q204	6-550-137-01	TRANSISTOR 2SD1938 (F)-ST (TX).SO		R220	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q205	6-550-137-01	TRANSISTOR 2SD1938 (F)-ST (TX).SO		R221	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q206	6-550-137-01	TRANSISTOR 2SD1938 (F)-ST (TX).SO		R222	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q207	6-550-137-01	TRANSISTOR 2SD1938 (F)-ST (TX).SO		R223	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q208	6-550-137-01	TRANSISTOR 2SD1938 (F)-ST (TX).SO		R224	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q209	6-550-137-01	TRANSISTOR 2SD1938 (F)-ST (TX).SO		R225	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q301	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L		R226	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q302	8-729-421-19	TRANSISTOR UN2213-TX		R227	1-208-782-11	METAL CHIP	1K 0.5% 1/10W
Q303	8-729-424-70	TRANSISTOR UN2217-TX		R228	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
Q304	8-729-424-02	TRANSISTOR 2SB709A-QRS-TX		R229	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
Q305	6-550-137-01	TRANSISTOR 2SD1938 (F)-ST (TX).SO		R230	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
Q306	6-550-137-01	TRANSISTOR 2SD1938 (F)-ST (TX).SO		R231	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
Q310	8-729-049-31	TRANSISTOR 2SB710A-RTX		R232	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
Q311	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L		R233	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
Q312	8-729-424-02	TRANSISTOR 2SB709A-QRS-TX		R234	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
< RESISTOR >							
R101	1-216-295-91	SHORT CHIP	0	R235	1-216-063-91	RES-CHIP	3.9K 5% 1/10W
< DIODE >							
R103	1-216-061-91	RES-CHIP		R236	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R108	1-216-073-91	RES-CHIP		R237	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R109	1-216-021-00	METAL CHIP		R238	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R110	1-216-021-00	METAL CHIP		R239	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R111	1-216-021-00	METAL CHIP		R240	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R112	1-216-021-00	METAL CHIP		R241	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R113	1-216-021-00	METAL CHIP		R242	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R114	1-216-021-00	METAL CHIP		R243	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R115	1-216-021-00	METAL CHIP		R244	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
R116	1-216-021-00	METAL CHIP		R245	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W
R117	1-216-021-00	METAL CHIP		R246	1-208-790-11	METAL CHIP	2.2K 0.5% 1/10W
R201	1-216-065-91	RES-CHIP		R247	1-208-784-11	METAL CHIP	1.2K 0.5% 1/10W

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description		Remark	Ref. No.	Part No.	Description		Remark		
R248	1-208-790-11	METAL CHIP	2.2K	0.5%	1/10W	R336	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R249	1-208-790-11	METAL CHIP	2.2K	0.5%	1/10W	R337	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R250	1-208-790-11	METAL CHIP	2.2K	0.5%	1/10W	R341	1-216-097-11	RES-CHIP	100K	5%	1/10W
R251	1-216-063-91	RES-CHIP	3.9K	5%	1/10W	R347	1-216-041-00	METAL CHIP	470	5%	1/10W
R252	1-216-041-00	METAL CHIP	470	5%	1/10W	R348	1-216-041-00	METAL CHIP	470	5%	1/10W
R253	1-216-041-00	METAL CHIP	470	5%	1/10W	R349	1-216-041-00	METAL CHIP	470	5%	1/10W
R254	1-216-041-00	METAL CHIP	470	5%	1/10W	R350	1-216-041-00	METAL CHIP	470	5%	1/10W
R255	1-216-041-00	METAL CHIP	470	5%	1/10W	R363	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R256	1-216-041-00	METAL CHIP	470	5%	1/10W	R364	1-216-073-91	RES-CHIP	10K	5%	1/10W
R257	1-216-041-00	METAL CHIP	470	5%	1/10W	R365	1-216-097-11	RES-CHIP	100K	5%	1/10W
R258	1-216-089-91	RES-CHIP	47K	5%	1/10W	R366	1-216-041-00	METAL CHIP	470	5%	1/10W
R259	1-216-089-91	RES-CHIP	47K	5%	1/10W	R367	1-216-073-91	RES-CHIP	10K	5%	1/10W
R260	1-216-089-91	RES-CHIP	47K	5%	1/10W	R368	1-216-097-11	RES-CHIP	100K	5%	1/10W
R261	1-216-089-91	RES-CHIP	47K	5%	1/10W	A-6061-925-A DV-35 BOARD, COMPLETE					
R262	1-216-089-91	RES-CHIP	47K	5%	1/10W	*****					
R263	1-216-089-91	RES-CHIP	47K	5%	1/10W	(Ref. No. 1,000 Series)					
R264	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	< CAPACITOR >					
R265	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	C801	1-126-965-91	ELECT	22uF	20%	50V
R266	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	C802	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
R267	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	C803	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
R268	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	C804	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
R269	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	C805	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
R270	1-216-097-11	RES-CHIP	100K	5%	1/10W	C806	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
R271	1-216-295-91	SHORT CHIP	0			C807	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
R272	1-216-295-91	SHORT CHIP	0			C811	1-126-965-91	ELECT	22uF	20%	50V
R273	1-216-295-91	SHORT CHIP	0			C812	1-126-965-91	ELECT	22uF	20%	50V
R274	1-216-295-91	SHORT CHIP	0			< CONNECTOR >					
R275	1-216-295-91	SHORT CHIP	0			CN801	1-793-782-21	CONNECTOR, BOARD TO BOARD 23P			
R276	1-216-295-91	SHORT CHIP	0			CN802	1-506-476-11	PIN, CONNECTOR 11P			
R301	1-216-033-00	METAL CHIP	220	5%	1/10W	CN803	1-778-772-11	CONNECTOR, FFC/FPC 7P			
R302	1-216-021-00	METAL CHIP	68	5%	1/10W	* CN804	1-506-470-11	PIN, CONNECTOR 5P			
R303	1-216-049-11	RES-CHIP	1K	5%	1/10W	< DIODE >					
R304	1-216-049-11	RES-CHIP	1K	5%	1/10W	D801	8-719-069-54	DIODE UDZSTE-175.1B			
R305	1-216-073-91	RES-CHIP	10K	5%	1/10W	< IC >					
R306	1-216-649-11	METAL CHIP	820	0.5%	1/10W	IC801	8-759-598-69	IC BA6956AN			
R307	1-216-649-11	METAL CHIP	820	0.5%	1/10W	IC802	6-701-875-01	IC LMS8117ADTX-1.8/NOPB			
R308	1-216-649-11	METAL CHIP	820	0.5%	1/10W	< TRANSISTOR >					
R309	1-216-649-11	METAL CHIP	820	0.5%	1/10W	Q801	8-729-230-49	TRANSISTOR 2SC2712-YG-TE85L			
R310	1-216-049-11	RES-CHIP	1K	5%	1/10W	< RESISTOR >					
R311	1-208-782-11	METAL CHIP	1K	0.5%	1/10W	R801	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R312	1-208-782-11	METAL CHIP	1K	0.5%	1/10W	R802	1-216-049-11	RES-CHIP	1K	5%	1/10W
R313	1-208-782-11	METAL CHIP	1K	0.5%	1/10W	R803	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R314	1-208-782-11	METAL CHIP	1K	0.5%	1/10W	R804	1-216-091-00	METAL CHIP	56K	5%	1/10W
R316	1-208-790-11	METAL CHIP	2.2K	0.5%	1/10W	R805	1-216-033-00	METAL CHIP	220	5%	1/10W
R317	1-208-790-11	METAL CHIP	2.2K	0.5%	1/10W	R806	1-216-049-11	RES-CHIP	1K	5%	1/10W
R318	1-208-784-11	METAL CHIP	1.2K	0.5%	1/10W	< DIODE >					
R320	1-208-784-11	METAL CHIP	1.2K	0.5%	1/10W	R801	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R321	1-208-784-11	METAL CHIP	1.2K	0.5%	1/10W	R802	1-216-049-11	RES-CHIP	1K	5%	1/10W
R322	1-208-790-11	METAL CHIP	2.2K	0.5%	1/10W	R803	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R323	1-208-784-11	METAL CHIP	1.2K	0.5%	1/10W	R804	1-216-091-00	METAL CHIP	56K	5%	1/10W
R324	1-208-790-11	METAL CHIP	2.2K	0.5%	1/10W	R805	1-216-033-00	METAL CHIP	220	5%	1/10W
R325	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R806	1-216-049-11	RES-CHIP	1K	5%	1/10W
R327	1-216-041-00	METAL CHIP	470	5%	1/10W	< IC >					
R328	1-216-041-00	METAL CHIP	470	5%	1/10W	< TRANSISTOR >					
R329	1-216-073-91	RES-CHIP	10K	5%	1/10W	< RESISTOR >					
R330	1-216-089-91	RES-CHIP	47K	5%	1/10W	R801	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R331	1-216-073-91	RES-CHIP	10K	5%	1/10W	R802	1-216-049-11	RES-CHIP	1K	5%	1/10W
R332	1-216-089-91	RES-CHIP	47K	5%	1/10W	R803	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R333	1-216-089-91	RES-CHIP	47K	5%	1/10W	R804	1-216-091-00	METAL CHIP	56K	5%	1/10W
R334	1-216-073-91	RES-CHIP	10K	5%	1/10W	R805	1-216-033-00	METAL CHIP	220	5%	1/10W

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark	
		FR-201 BOARD		C486	1-125-972-91	ELECT	100uF 20% 16V	
		*****	(Ref. No. 1,000 Series)			< CONNECTOR >		
		< CONNECTOR >		CN401	1-750-195-11	CONNECTOR, BOARD TO BOARD 6P		
CN601	1-750-186-11	CONNECTOR, BOARD TO BOARD 6P		CN402	1-794-708-11	PIN, CONNECTOR (PC BOARD) 7P		
CN602	1-815-412-11	CONNECTOR, FFC/FPC 5P		CN403	1-506-484-11	PIN, CONNECTOR 5P		
		< RESISTOR >		* CN404	1-695-821-11	CONNECTOR, BOARD TO BOARD 12P		
R601	1-216-081-00	METAL CHIP	22K 5%	1/10W	* CN405	1-785-530-11	PIN, CONNECTOR (PC BOARD) 10P	
R602	1-216-071-00	METAL CHIP	8.2K 5%	1/10W	CN471	1-506-491-11	PIN, CONNECTOR 12P	
R603	1-216-063-91	RES-CHIP	3.9K 5%	1/10W			< DIODE >	
R604	1-216-059-00	METAL CHIP	2.7K 5%	1/10W	D401	8-719-914-44	DIODE DAP202K-T-146	
R605	1-216-081-00	METAL CHIP	22K 5%	1/10W	D402	8-719-404-50	DIODE MA111-TX	
R606	1-216-071-00	METAL CHIP	8.2K 5%	1/10W	D403	8-719-404-50	DIODE MA111-TX	
R607	1-216-063-91	RES-CHIP	3.9K 5%	1/10W			< EARTH TERMINAL >	
R608	1-216-059-00	METAL CHIP	2.7K 5%	1/10W	* ET471	1-537-738-21	TERMINAL, EARTH	
		< SWITCH >		* ET472	1-537-738-21	TERMINAL, EARTH		
S601	1-771-349-21	SWITCH, KEYBOARD (DISC SELECT 2)					< IC >	
S602	1-771-349-21	SWITCH, KEYBOARD (DISC SELECT 3)			IC404	6-803-161-01	IC TMP86CK74AFG-4R68 (M	
S603	1-771-349-21	SWITCH, KEYBOARD (DISC SELECT 4)			IC406	6-703-745-01	IC GP1UE28SYKOF	
S604	1-771-349-21	SWITCH, KEYBOARD (DISC SELECT 5)			IC407	6-703-743-01	IC AN13992A	
S605	1-771-349-21	SWITCH, KEYBOARD (I/O)			IC408	6-703-742-01	IC S-80830CNUA-B8PT2G	
S606	1-771-349-21	SWITCH, KEYBOARD (PICTURE MODE)					< FLUORESCENT INDICATOR >	
S607	1-771-349-21	SWITCH, KEYBOARD (SURROUND)			ND401	1-518-878-11	VACUUM FLUORESCENT DISPLAY	
S608	1-771-349-21	SWITCH, KEYBOARD (ONE/ALL)					< IC LINK >	
S609	1-771-349-21	SWITCH, KEYBOARD (LOAD)			△ PS472	1-576-509-21	IC LINK (1A/50V)	
S610	1-771-349-21	SWITCH, KEYBOARD (DISC SELECT 1)					< TRANSISTOR >	
<hr/>								
A-6061-921-A IF-103 BOARD, COMPLETE								

		(Ref. No. 1,000 Series)						
		< BUZZER >						
BZ401	1-529-986-11	BUZZER, VOLTAGE						
		< CAPACITOR >						
C401	1-124-434-00	ELECT	220uF 20%	4V	Q401	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
C402	1-163-009-91	CERAMIC CHIP	0.001uF 10%	50V	Q402	8-729-230-49	TRANSISTOR	2SC2712-YG-TE85L
C418	1-163-021-91	CERAMIC CHIP	0.01uF 10%	0V	Q403	8-729-421-22	TRANSISTOR	UN2211-TX
C420	1-163-021-91	CERAMIC CHIP	0.01uF 10%	50V	Q404	8-729-424-08	TRANSISTOR	UN2111-TX
C423	1-163-021-91	CERAMIC CHIP	0.01uF 10%	50V	U Q407	8-729-027-25	TRANSISTOR	DTA114WKA-T146
		< RESISTOR >						
C424	1-164-004-11	CERAMIC CHIP	0.1uF 10%	25V				
C426	1-163-021-91	CERAMIC CHIP	0.01uF 10%	50V	R401	1-216-073-91	RES-CHIP	10K 5% 1/10W
C427	1-164-004-11	CERAMIC CHIP	0.1uF 10%	25V	R402	1-216-049-11	RES-CHIP	1K 5% 1/10W
C428	1-164-004-11	CERAMIC CHIP	0.1uF 10%	25V	R403	1-216-085-91	RES-CHIP	33K 5% 1/10W
C431	1-163-021-91	CERAMIC CHIP	0.01uF 10%	50V	R404	1-216-089-91	RES-CHIP	47K 5% 1/10W
		< METAL CHIP >			R406	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
C432	1-163-009-91	CERAMIC CHIP	0.001uF 10%	50V				
C440	1-162-970-11	CERAMIC CHIP	0.01uF 10%	25V	R407	1-216-013-00	METAL CHIP	33 5% 1/10W
C441	1-124-589-11	ELECT	47uF 20%	16V	R408	1-216-073-91	RES-CHIP	10K 5% 1/10W
C471	1-162-970-11	CERAMIC CHIP	0.01uF 10%	25V	R409	1-216-073-91	RES-CHIP	10K 5% 1/10W
C478	1-162-970-11	CERAMIC CHIP	0.01uF 10%	25V	R415	1-216-017-91	RES-CHIP	47 5% 1/10W
		< CERAMIC CHIP >			R418	1-216-027-00	METAL CHIP	120 5% 1/10W
C480	1-162-970-11	CERAMIC CHIP	0.01uF 10%	25V				
C481	1-125-972-91	ELECT	100uF 20%	16V	R421	1-216-073-91	RES-CHIP	10K 5% 1/10W
C482	1-162-970-11	CERAMIC CHIP	0.01uF 10%	25V	R424	1-216-073-91	RES-CHIP	10K 5% 1/10W
C483	1-162-970-11	CERAMIC CHIP	0.01uF 10%	25V	R425	1-216-073-91	RES-CHIP	10K 5% 1/10W
C484	1-128-111-11	ELECT	100uF 20%	25V	R427	1-216-073-91	RES-CHIP	10K 5% 1/10W

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description		Remark	
R428	1-216-025-11	RES-CHIP	100	5%	1/10W	C132	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
R429	1-216-097-11	RES-CHIP	100K	5%	1/10W	C137	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
R430	1-216-097-11	RES-CHIP	100K	5%	1/10W	C138	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
R432	1-216-097-11	RES-CHIP	100K	5%	1/10W	C201	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
R433	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	C202	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
R434	1-216-097-11	RES-CHIP	100K	5%	1/10W	C210	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
R437	1-216-073-91	RES-CHIP	10K	5%	1/10W	C211	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
R441	1-216-073-91	RES-CHIP	10K	5%	1/10W	C212	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
R442	1-216-025-11	RES-CHIP	100	5%	1/10W	C213	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
R443	1-216-025-11	RES-CHIP	100	5%	1/10W	C214	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
R444	1-216-025-11	RES-CHIP	100	5%	1/10W	C215	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
R445	1-216-025-11	RES-CHIP	100	5%	1/10W	C216	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
R446	1-216-025-11	RES-CHIP	100	5%	1/10W	C218	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
R447	1-216-025-11	RES-CHIP	100	5%	1/10W	C219	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
R448	1-216-025-11	RES-CHIP	100	5%	1/10W	C220	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
▲R453	1-216-358-11	METAL OXIDE	5.6	5%	1W	C221	1-124-779-00	ELECT CHIP	10uF	20%	16V
▲R455	1-216-427-00	METAL OXIDE	120	5%	1W	C225	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
▲R456	1-216-427-00	METAL OXIDE	120	5%	1W	C226	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
R459	1-216-298-00	METAL CHIP	2.2	5%	1/10W	C228	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
R460	1-216-073-91	RES-CHIP	10K	5%	1/10W	C229	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
R475	1-216-073-91	RES-CHIP	10K	5%	1/10W	C230	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
R476	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	C232	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
R477	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	C233	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
R478	1-216-061-91	RES-CHIP	3.3K	5%	1/10W	C234	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
R496	1-216-017-91	RES-CHIP	47	5%	1/10W	C235	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
					< VIBRATOR >	C236	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
X401	1-781-472-21	VIBRATOR, CERAMIC (8MHz)				C238	1-124-779-00	ELECT CHIP	10uF	20%	16V
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A-6061-917-A MB-110 BOARD, COMPLETE											

(Ref. No. 2,000 Series)											
< CAPACITOR >											
C101	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	C245	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C102	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C246	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C103	1-126-209-11	ELECT CHIP	100uF	20%	4V	C247	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C104	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C248	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C105	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C249	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C106	1-162-914-11	CERAMIC CHIP	9PF	0.50PF	50V	C250	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C107	1-162-914-11	CERAMIC CHIP	9PF	0.50PF	50V	C251	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C108	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C252	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C109	1-126-209-11	ELECT CHIP	100uF	20%	4V	C253	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C111	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C254	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C113	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C255	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C256	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C118	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	C257	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C120	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C258	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C121	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C259	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C122	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C260	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C124	1-126-206-11	ELECT CHIP	100uF	20%	6.3V	C261	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C125	1-126-607-11	ELECT CHIP	47uF	20%	4V	C262	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C126	1-126-204-11	ELECT CHIP	47uF	20%	16V	C263	1-124-779-00	ELECT CHIP	10uF	20%	16V
C127	1-126-246-11	ELECT CHIP	220uF	20%	4V	C264	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C128	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C265	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C129	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C266	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C130	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C270	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

The components identified by mark ▲ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

MB-110

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description		Remark
C626	1-126-206-11	ELECT CHIP	100uF	20%	6.3V	FB105	1-469-324-21	FERRITE	0uH	
C627	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	FB106	1-469-324-21	FERRITE	0uH	
C628	1-164-315-11	CERAMIC CHIP	470PF	5%	50V	FB107	1-469-324-21	FERRITE	0uH	
C629	1-164-315-11	CERAMIC CHIP	470PF	5%	50V	FB108	1-469-324-21	FERRITE	0uH	
C630	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V	FB109	1-469-324-21	FERRITE	0uH	
C631	1-127-956-21	FILM CHIP	0.1uF	5%	16V	FB110	1-469-324-21	FERRITE	0uH	
C632	1-127-956-21	FILM CHIP	0.1uF	5%	16V	FB111	1-469-324-21	FERRITE	0uH	
C633	1-164-733-11	CERAMIC CHIP	820PF	10%	50V	FB501	1-469-784-11	FERRITE	0uH	
C634	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	FB502	1-469-784-11	FERRITE	0uH	
C635	1-126-206-11	ELECT CHIP	100uF	20%	6.3V					< FILTER >
C636	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	FL102	1-234-177-21	FERRITE	0uH	
C637	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	FL103	1-234-177-21	FERRITE	0uH	
C638	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	FL104	1-234-177-21	FERRITE	0uH	
C639	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL105	1-234-177-21	FERRITE	0uH	
C640	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	FL106	1-234-177-21	FERRITE	0uH	
C901	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL107	1-233-893-21	FILTER, CHIP EMI		
C902	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL108	1-234-177-21	FERRITE	0uH	
C903	1-124-779-00	ELECT CHIP	10uF	20%	16V	FL109	1-234-177-21	FERRITE	0uH	
C904	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL201	1-234-177-21	FERRITE	0uH	
C905	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	FL402	1-234-177-21	FERRITE	0uH	
C907	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL403	1-234-177-21	FERRITE	0uH	
C909	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL404	1-234-177-21	FERRITE	0uH	
C910	1-126-209-11	ELECT CHIP	100uF	20%	4V	FL501	1-234-177-21	FERRITE	0uH	
C912	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	FL502	1-234-177-21	FERRITE	0uH	
C913	1-126-209-11	ELECT CHIP	100uF	20%	4V	FL901	1-234-177-21	FERRITE	0uH	
C914	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL902	1-234-177-21	FERRITE	0uH	
C915	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL903	1-234-177-21	FERRITE	0uH	
C916	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	FL905	1-234-177-21	FERRITE	0uH	
C917	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V					< IC >
C919	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC101	8-759-641-86	IC BR24C16F-E2		
C920	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC102	6-702-302-01	IC TK11133CSCL-G		
C921	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC103	6-701-877-01	IC SM8707EV-G-E2		
C922	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC104	6-701-837-01	IC MB91307RPFV-G-BND-E1		
C923	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC106	8-759-826-41	IC MBM29DL324BE-90PFTN		
C925	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC108	6-701-874-01	IC IDT71V016SA15PH8 (SCD2994)		
C926	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC201	6-703-445-01	IC SP3726A		
C927	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC202	6-701-878-01	IC FAN8034L		
C928	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC301	6-701-876-01	IC CXD9703R		
C929	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC302	6-702-302-01	IC TK11133CSCL-G		
C930	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC303	6-701-969-01	IC K4F151612D-UL60T		
C931	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC401	6-702-300-01	IC TK11118CSCL-G		
C932	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC403	8-752-416-45	IC CXD1935Q		
C933	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC404	6-702-610-01	IC MSM56V16160F-10T47M1		
C934	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	IC405	6-702-610-01	IC MSM56V16160F-10T47M1		
C935	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	IC501	8-752-418-21	IC CXD1938AR		
C936	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	IC502	6-704-222-01	IC AK4358VQ-L		
						IC601	6-702-301-01	IC TK11125CSCL-G		
						IC602	6-701-814-01	IC CXD9698R		
						IC603	6-702-610-01	IC MSM56V16160F-10T47M1		
						IC604	6-701-079-01	IC ADV7300AKST		
						IC605	6-702-301-01	IC TK11125CSCL-G		
L CN203	1-815-507-21	CONNECTOR, FFC/FPC 26P				IC901	6-704-261-01	IC TK11225CMCL-G		
CN205	1-695-320-91	PIN, CONNECTOR 2P				IC903	6-702-610-01	IC MSM56V16160F-10T47M1		
CN501	1-766-382-91	PIN, CONNECTOR 10P				IC905	8-752-416-77	IC CXD2753R		
L CN502	1-817-097-91	PIN, CONNECTOR (1.5MM) (SMD)13P				IC906	6-702-231-01	IC LMH6642MFX/NOPB		
										< CONNECTOR >
										< DIODE >
D501	8-719-914-44	DIODE DAP202K-T-146								< FERRITE BEAD >
D503	8-719-914-44	DIODE DAP202K-T-146								< COIL >
FB104	1-469-324-21	FERRITE	0uH			L101	1-414-410-21	INDUCTOR	10uH	

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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
L201	1-412-031-11	INDUCTOR CHIP	47uH	R173	1-216-829-11	METAL CHIP	4.7K
L202	1-412-031-11	INDUCTOR CHIP	47uH	R176	1-216-809-11	METAL CHIP	100
< TRANSISTOR >							
Q201	8-729-903-46	TRANSISTOR	2SB1132-T100-QR	R178	1-216-809-11	METAL CHIP	100
Q202	8-729-903-46	TRANSISTOR	2SB1132-T100-QR	R179	1-216-809-11	METAL CHIP	100
< RESISTOR >							
R021	1-216-833-11	METAL CHIP	10K	R180	1-216-805-11	METAL CHIP	47
R102	1-216-833-11	METAL CHIP	10K	R181	1-216-801-11	METAL CHIP	22
R106	1-216-821-11	METAL CHIP	1K	R182	1-216-801-11	METAL CHIP	22
R107	1-216-837-11	METAL CHIP	22K	R183	1-216-809-11	METAL CHIP	100
R108	1-216-864-11	SHORT CHIP	0	R184	1-216-864-11	SHORT CHIP	0
R109	1-216-805-11	METAL CHIP	47	R185	1-216-864-11	SHORT CHIP	0
R110	1-216-805-11	METAL CHIP	47	R187	1-216-809-11	METAL CHIP	100
R111	1-216-821-11	METAL CHIP	1K	R188	1-216-809-11	METAL CHIP	100
R112	1-216-845-11	METAL CHIP	100K	R189	1-216-809-11	METAL CHIP	100
R113	1-216-845-11	METAL CHIP	100K	R190	1-216-809-11	METAL CHIP	100
R114	1-216-821-11	METAL CHIP	1K	R192	1-216-864-11	SHORT CHIP	0
R115	1-216-821-11	METAL CHIP	1K	R193	1-216-809-11	METAL CHIP	100
R117	1-216-833-11	METAL CHIP	10K	R194	1-216-864-11	SHORT CHIP	0
R118	1-216-833-11	METAL CHIP	10K	R195	1-216-809-11	METAL CHIP	100
R119	1-216-797-11	METAL CHIP	10	R196	1-216-809-11	METAL CHIP	100
R120	1-216-797-11	METAL CHIP	10	R197	1-216-809-11	METAL CHIP	100
R121	1-216-797-11	METAL CHIP	10	R198	1-216-809-11	METAL CHIP	100
R122	1-216-797-11	METAL CHIP	10	R206	1-216-829-11	METAL CHIP	4.7K
R123	1-216-827-11	METAL CHIP	3.3K	R210	1-216-815-11	METAL CHIP	330
R124	1-216-827-11	METAL CHIP	3.3K	R211	1-216-809-11	METAL CHIP	100
R125	1-216-833-11	METAL CHIP	10K	R212	1-216-809-11	METAL CHIP	100
R126	1-216-833-11	METAL CHIP	10K	R218	1-216-846-11	METAL CHIP	120K
R133	1-216-833-11	METAL CHIP	10K	R219	1-216-846-11	METAL CHIP	120K
R136	1-216-833-11	METAL CHIP	10K	R220	1-216-847-11	METAL CHIP	150K
R138	1-216-809-11	METAL CHIP	100	R221	1-216-847-11	METAL CHIP	150K
R139	1-216-833-11	METAL CHIP	10K	R222	1-216-842-11	METAL CHIP	56K
R140	1-216-821-11	METAL CHIP	1K	R223	1-216-842-11	METAL CHIP	56K
R141	1-216-797-11	METAL CHIP	10	R224	1-216-850-11	METAL CHIP	270K
R142	1-216-797-11	METAL CHIP	10	R225	1-216-833-11	METAL CHIP	10K
R144	1-216-797-11	METAL CHIP	10	R226	1-216-853-11	METAL CHIP	470K
R145	1-216-821-11	METAL CHIP	1K	R227	1-216-846-11	METAL CHIP	120K
R146	1-216-797-11	METAL CHIP	10	R229	1-216-833-11	METAL CHIP	10K
R147	1-216-805-11	METAL CHIP	47	R230	1-216-839-11	METAL CHIP	33K
R148	1-216-809-11	METAL CHIP	100	R231	1-216-855-11	METAL CHIP	680K
R149	1-216-833-11	METAL CHIP	10K	R232	1-216-839-11	METAL CHIP	33K
R150	1-216-827-11	METAL CHIP	3.3K	R233	1-216-853-11	METAL CHIP	470K
R152	1-216-833-11	METAL CHIP	10K	R234	1-211-981-11	METAL CHIP	33
R153	1-216-827-11	METAL CHIP	3.3K	R235	1-216-809-11	METAL CHIP	100
R154	1-216-809-11	METAL CHIP	100	R236	1-211-981-11	METAL CHIP	33
R155	1-216-833-11	METAL CHIP	10K	R238	1-216-839-11	METAL CHIP	33K
R156	1-216-827-11	METAL CHIP	3.3K	R239	1-216-839-11	METAL CHIP	33K
R157	1-216-809-11	METAL CHIP	100	R240	1-216-839-11	METAL CHIP	33K
R159	1-216-833-11	METAL CHIP	10K	R241	1-216-839-11	METAL CHIP	33K
R160	1-216-809-11	METAL CHIP	100	R242	1-216-849-11	METAL CHIP	220K
R163	1-216-809-11	METAL CHIP	100	R243	1-216-853-11	METAL CHIP	470K
R165	1-216-833-11	METAL CHIP	10K	R244	1-216-821-11	METAL CHIP	1K
R166	1-216-057-00	METAL CHIP	2.2K	R245	1-216-841-11	METAL CHIP	47K
R167	1-216-809-11	METAL CHIP	100	R246	1-216-809-11	METAL CHIP	100
R168	1-216-864-11	SHORT CHIP	0	R248	1-216-803-11	METAL CHIP	33
R170	1-216-864-11	SHORT CHIP	0	R249	1-216-803-11	METAL CHIP	33
R171	1-216-833-11	METAL CHIP	10K	R250	1-218-895-11	METAL CHIP	100K
R172	1-216-821-11	METAL CHIP	1K	R251	1-216-841-11	METAL CHIP	47K
				R252	1-216-839-11	METAL CHIP	33K
				R253	1-218-889-11	METAL CHIP	56K
				R254	1-218-895-11	METAL CHIP	100K

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
R255	1-218-889-11	METAL CHIP	56K	0.5%	1/10W	R430	1-216-833-11	METAL CHIP	10K	5%	1/10W
R256	1-216-809-11	METAL CHIP	100	5%	1/10W	R434	1-216-797-11	METAL CHIP	10	5%	1/10W
R259	1-216-833-11	METAL CHIP	10K	5%	1/10W	R502	1-216-864-11	SHORT CHIP	0		
R260	1-216-834-11	METAL CHIP	12K	5%	1/10W	R503	1-216-864-11	SHORT CHIP	0		
R261	1-216-833-11	METAL CHIP	10K	5%	1/10W	R504	1-216-864-11	SHORT CHIP	0		
R262	1-216-815-11	METAL CHIP	330	5%	1/10W	R505	1-216-864-11	SHORT CHIP	0		
R263	1-216-861-11	METAL CHIP	2.2M	5%	1/10W	R506	1-216-864-11	SHORT CHIP	0		
R264	1-216-845-11	METAL CHIP	100K	5%	1/10W	R509	1-216-864-11	SHORT CHIP	0		
R265	1-216-838-11	METAL CHIP	27K	5%	1/10W	R511	1-216-864-11	SHORT CHIP	0		
R269	1-216-833-11	METAL CHIP	10K	5%	1/10W	R520	1-216-809-11	METAL CHIP	100	5%	1/10W
R273	1-216-864-11	SHORT CHIP	0			R524	1-216-864-11	SHORT CHIP	0		
R274	1-216-833-11	METAL CHIP	10K	5%	1/10W	R525	1-216-833-11	METAL CHIP	10K	5%	1/10W
R281	1-216-864-11	SHORT CHIP	0			R527	1-216-833-11	METAL CHIP	10K	5%	1/10W
R282	1-216-864-11	SHORT CHIP	0			R528	1-216-864-11	SHORT CHIP	0		
R284	1-216-864-11	SHORT CHIP	0			R530	1-216-833-11	METAL CHIP	10K	5%	1/10W
R301	1-216-295-91	SHORT CHIP	0			R531	1-216-833-11	METAL CHIP	10K	5%	1/10W
R302	1-216-295-91	SHORT CHIP	0			R532	1-216-833-11	METAL CHIP	10K	5%	1/10W
R310	1-216-821-11	METAL CHIP	1K	5%	1/10W	R536	1-216-864-11	SHORT CHIP	0		
R311	1-216-809-11	METAL CHIP	100	5%	1/10W	R539	1-216-864-11	SHORT CHIP	0		
R312	1-218-831-11	METAL CHIP	220	0.5%	1/10W	R541	1-216-864-11	SHORT CHIP	0		
R313	1-216-817-11	METAL CHIP	470	5%	1/10W	R544	1-216-864-11	SHORT CHIP	0		
R314	1-216-817-11	METAL CHIP	470	5%	1/10W	R546	1-216-864-11	SHORT CHIP	0		
R315	1-216-817-11	METAL CHIP	470	5%	1/10W	R547	1-216-833-11	METAL CHIP	10K	5%	1/10W
R316	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R549	1-216-864-11	SHORT CHIP	0		
R317	1-216-833-11	METAL CHIP	10K	5%	1/10W	R551	1-216-864-11	SHORT CHIP	0		
R318	1-216-817-11	METAL CHIP	470	5%	1/10W	R552	1-216-864-11	SHORT CHIP	0		
R319	1-218-871-11	METAL CHIP	10K	0.5%	1/10W	R557	1-216-864-11	SHORT CHIP	0		
R320	1-218-883-11	METAL CHIP	33K	0.5%	1/10W	R588	1-216-864-11	SHORT CHIP	0		
R321	1-218-879-11	METAL CHIP	22K	0.5%	1/10W	R589	1-216-864-11	SHORT CHIP	0		
R322	1-218-847-11	METAL CHIP	1K	0.5%	1/10W	R590	1-216-797-11	METAL CHIP	10	5%	1/10W
R323	1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W	R592	1-216-864-11	SHORT CHIP	0		
R324	1-216-833-11	METAL CHIP	10K	5%	1/10W	R603	1-216-809-11	METAL CHIP	100	5%	1/10W
R325	1-218-867-11	METAL CHIP	6.8K	5%	1/10W	R605	1-216-833-11	METAL CHIP	10K	5%	1/10W
R326	1-216-833-11	METAL CHIP	10K	5%	1/10W	R613	1-216-864-11	SHORT CHIP	0		
R327	1-218-871-11	METAL CHIP	10K	0.5%	1/10W	R615	1-218-285-11	METAL CHIP	75	5%	1/10W
R328	1-216-838-11	METAL CHIP	27K	5%	1/10W	R617	1-218-292-11	METAL CHIP	20K	5%	1/10W
R329	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R618	1-216-864-11	SHORT CHIP	0		
R330	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R639	1-216-864-11	SHORT CHIP	0		
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R640	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R332	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R659	1-216-864-11	SHORT CHIP	0		
R333	1-216-847-11	METAL CHIP	150K	5%	1/10W	R661	1-216-864-11	SHORT CHIP	0		
R334	1-218-853-11	METAL CHIP	1.8K	0.5%	1/10W	R674	1-216-819-11	METAL CHIP	680	5%	1/10W
R335	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R675	1-216-821-11	METAL CHIP	1K	5%	1/10W
R336	1-216-833-11	METAL CHIP	10K	5%	1/10W	R676	1-216-821-11	METAL CHIP	1K	5%	1/10W
R337	1-216-833-11	METAL CHIP	10K	5%	1/10W	R677	1-216-809-11	METAL CHIP	100	5%	1/10W
R338	1-216-801-11	METAL CHIP	22	5%	1/10W	R678	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R349	1-216-833-11	METAL CHIP	10K	5%	1/10W	R679	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R351	1-216-295-91	SHORT CHIP	0			R680	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R352	1-216-295-91	SHORT CHIP	0			R681	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R358	1-216-833-11	METAL CHIP	10K	5%	1/10W	R682	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R359	1-216-833-11	METAL CHIP	10K	5%	1/10W	R683	1-218-834-11	METAL CHIP	300	0.5%	1/10W
R360	1-216-809-11	METAL CHIP	100	5%	1/10W	R686	1-216-809-11	METAL CHIP	100	5%	1/10W
R366	1-216-801-11	METAL CHIP	22	5%	1/10W	R687	1-216-809-11	METAL CHIP	100	5%	1/10W
R402	1-216-295-91	SHORT CHIP	0			R690	1-216-864-11	SHORT CHIP	0		
R407	1-216-809-11	METAL CHIP	100	5%	1/10W	R801	1-216-864-11	SHORT CHIP	0		
R414	1-216-833-11	METAL CHIP	10K	5%	1/10W	R802	1-216-864-11	SHORT CHIP	0		
R416	1-218-867-11	METAL CHIP	6.8K	5%	1/10W	R803	1-216-864-11	SHORT CHIP	0		
R418	1-216-822-11	METAL CHIP	1.2K	5%	1/10W	R804	1-216-864-11	SHORT CHIP	0		
R419	1-216-797-11	METAL CHIP	10	5%	1/10W	R805	1-216-864-11	SHORT CHIP	0		
R426	1-216-833-11	METAL CHIP	10K	5%	1/10W	R806	1-216-864-11	SHORT CHIP	0		

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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R807	1-216-864-11	SHORT CHIP	0			< VIBRATOR >	
R808	1-216-864-11	SHORT CHIP	0			X101 1-795-174-11 VIBRATOR, CERAMIC (16.5MHz)	
R809	1-216-864-11	SHORT CHIP	0			X102 1-781-867-21 VIBRATOR, CRYSTAL (27MHz)	
R810	1-216-864-11	SHORT CHIP	0				
R812	1-216-864-11	SHORT CHIP	0				
R813	1-216-864-11	SHORT CHIP	0				
R815	1-216-864-11	SHORT CHIP	0				
R850	1-216-864-11	SHORT CHIP	0				
R902	1-216-864-11	SHORT CHIP	0			< CONNECTOR >	
R909	1-216-834-11	METAL CHIP	12K 5% 1/10W			CN001 1-506-490-21 PIN, CONNECTOR 11P	
R910	1-216-867-11	METAL CHIP	6.8K 5% 1/10W			CN002 1-784-767-11 CONNECTOR, FFC 6P	
R913	1-216-803-11	METAL CHIP	33 5% 1/10W	*		CN003 1-564-013-11 PIN, CONNECTOR 3P	
R915	1-216-821-11	METAL CHIP	1K 5% 1/10W			CN004 1-506-481-11 PIN, CONNECTOR 2P	
R916	1-216-827-11	METAL CHIP	3.3K 5% 1/10W				
R918	1-216-864-11	SHORT CHIP	0			< SWITCH >	
R919	1-216-809-11	METAL CHIP	100 5% 1/10W			U S001 1-786-357-12 SWITCH, LEVER (SLIDE) (TRAY OPEN/CLOSE)	
R921	1-216-833-11	METAL CHIP	10K 5% 1/10W				
R922	1-216-833-11	METAL CHIP	10K 5% 1/10W				
R931	1-216-833-11	METAL CHIP	10K 5% 1/10W			PL-33 BOARD	
R955	1-216-809-11	METAL CHIP	100 5% 1/10W			*****	
R956	1-216-809-11	METAL CHIP	100 5% 1/10W			(Ref. No. 1,000 Series)	
R957	1-216-809-11	METAL CHIP	100 5% 1/10W				
R958	1-216-809-11	METAL CHIP	100 5% 1/10W			< CONNECTOR >	
R959	1-216-809-11	METAL CHIP	100 5% 1/10W			CN701 1-815-412-11 CONNECTOR, FFC/FPC 5P	
R960	1-216-809-11	METAL CHIP	100 5% 1/10W				
R961	1-216-809-11	METAL CHIP	100 5% 1/10W			< LED >	
R963	1-216-809-11	METAL CHIP	100 5% 1/10W			D701 6-500-598-01 LED SDLB3DC0A0100-DEF	
R964	1-216-809-11	METAL CHIP	100 5% 1/10W			(MULTI CHANNEL)	
R1101	1-216-841-11	METAL CHIP	47K 5% 1/10W			D702 6-500-083-01 LED NSPW315BSRS (SACD)	
R1102	1-216-833-11	METAL CHIP	10K 5% 1/10W			D703 6-500-598-01 LED SDLB3DC0A0100-DEF (PROGRESSIVE)	
R1103	1-216-809-11	METAL CHIP	100 5% 1/10W				
R1104	1-216-821-11	METAL CHIP	1K 5% 1/10W			< RESISTOR >	
R1105	1-216-821-11	METAL CHIP	1K 5% 1/10W			R701 1-216-029-00 METAL CHIP 150 5% 1/10W	
R1106	1-216-821-11	METAL CHIP	1K 5% 1/10W			R702 1-216-017-91 RES-CHIP 47 5% 1/10W	
R1107	1-216-813-11	METAL CHIP	220 5% 1/10W			R703 1-216-029-00 METAL CHIP 150 5% 1/10W	
R1108	1-216-813-11	METAL CHIP	220 5% 1/10W				
R1109	1-216-809-11	METAL CHIP	100 5% 1/10W				
R1111	1-216-864-11	SHORT CHIP	0				
R1115	1-216-864-11	SHORT CHIP	0			A-6060-642-A SE-130 BOARD, COMPLETE	

						(Ref. No. 3,000 Series)	
						< CONNECTOR >	
RB102	1-233-270-11	NETWORK, RES (8 GANG) 10K				CN101 1-750-243-11 SOCKET, CONNECTOR 6P	
RB103	1-233-576-11	RES, CHIP NETWORK 100				CN102 1-573-383-11 PIN, CONNECTOR (PC BOARD) 2P	
RB104	1-233-576-11	RES, CHIP NETWORK 100					
RB105	1-233-576-11	RES, CHIP NETWORK 100				< PHOTO INTERRUPTER >	
RB106	1-233-576-11	RES, CHIP NETWORK 100				PH101 8-749-017-45 SENSOR, PHONT RPR-220C1N	
RB107	1-233-576-11	RES, CHIP NETWORK 100				(DISC SENSOR)	
RB108	1-233-576-11	RES, CHIP NETWORK 100				U PH102 6-600-072-01 IC RPI-392 (TRAY SENSOR)	
RB109	1-233-576-11	RES, CHIP NETWORK 100					
RB110	1-233-576-11	RES, CHIP NETWORK 100					
RB111	1-233-576-11	RES, CHIP NETWORK 100					
RB901	1-236-908-11	RES, CHIP NETWORK 10K (3216)				SW-396 BOARD	
RB902	1-236-908-11	RES, CHIP NETWORK 10K (3216)				*****	
						(Ref. No. 1,000 Series)	
						< CONNECTOR >	
RV601	1-223-583-41	RES, ADJ, CARBON (3 TYPE) 1K				* CN501 1-695-820-11 CONNECTOR, BOARD TO BOARD 12P	
RV602	1-223-583-41	RES, ADJ, CARBON (3 TYPE) 1K				CN502 1-778-772-11 CONNECTOR, FFC/FPC 7P	
						< RESISTOR >	
						R502 1-216-059-00 METAL CHIP 2.7K 5% 1/10W	

Ref. No.	Part No.	Description			Remark
R503	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R505	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R506	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R507	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R508	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R509	1-216-059-00	METAL CHIP	2.7K	5%	1/10W

< SWITCH >

S501	1-771-349-21	SWITCH, KEYBOARD (▷)
S502	1-771-349-21	SWITCH, KEYBOARD (II)
S503	1-771-349-21	SWITCH, KEYBOARD (■)
S504	1-771-349-21	SWITCH, KEYBOARD (◀◀)
S505	1-771-349-21	SWITCH, KEYBOARD (▶▶I)
S506	1-771-349-21	SWITCH, KEYBOARD (△)
S507	1-771-349-21	SWITCH, KEYBOARD (EXCHANGE)
S508	1-771-349-21	SWITCH, KEYBOARD (DISC SKIP)
S509	1-771-349-21	SWITCH, KEYBOARD (PROGRESSIVE)
S510	1-771-349-21	SWITCH, KEYBOARD (SACD MULTI/2CH)
S511	1-771-349-21	SWITCH, KEYBOARD (SACD SACD/CD)

▲ 1-468-765-12 POWER BLOCK (SRV1439UC)

(Ref. No. 4,000 Series)

< FUSE >

△ F101

FUSE (2A/125V)

MISCELLANEOUS

△2	1-468-765-12	POWER BLOCK
△8	1-783-532-32	CORD, POWER
△167	A-6061-908-A	KHM-290AAA SERVICE ASSY
M001	X-3952-378-1	MOTOR ASSY, LOADING

ACCESSORIES & PACKING MATERIALS

1-478-015-11	REMOTE COMMANDER (RMT-D159A)
1-751-271-11	CORD, CONNECTION
3-073-096-01	COVER, BATTERY (for RMT-D159A)
3-082-035-11	MANUAL, INSTRUCTION (ENGLISH)

The components identified by mark ▲ or dotted line with mark ▲ are critical for safety.
Replace only with part number specified.

